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2010 Urban Water Management Plan

June 2011

Prepared for

West Kern Water District
P.O. Box 1105
Taft, CA 93268

K/J 1074009*00

RESOLUTION 11-02
RESOLUTION OF THE GOVERNING BOARD OF
WEST KERN WATER DISTRICT
ADOPTING THE 2010 URBAN WATER MANAGEMENT PLAN
RESCENDING RESOLUTION No. 06-09

WHEREAS, the California Urban Water Management Planning Act, Water Code section 10610 et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated Urban Water Management Plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

WHEREAS, the West Kern Water District (WKWD) is an urban water supplier for purposes of the Act, and approved and adopted its most recent 2005 UWMP and submitted that UWMP to the California Department of Water Resources (DWR); and

WHEREAS, the Water Conservation Act of 2009, Water Code section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt their 2010 UWMPs to July 1, 2011 and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use 15 percent by the year 2015 and 20 percent by the year 2020; and

WHEREAS, the West Kern Water District is an "urban retail water supplier" for purposes of SBX7-7 because it directly provides potable municipal water to more than 3,000 end users; and

WHEREAS, in accordance with applicable law, including the requirements of the Act and SBX7-7, the West Kern Water District has prepared its 2010 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to its 2010 UWMP; and

WHEREAS, as authorized by Section 10620(e) of the Act, the West Kern Water District has prepared its 2010 UWMP with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its UWMP, and has also in part utilized and relied upon the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan (March 2011) and the DWR Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009) (February 2011) in preparing its 2010 UWMP; and

WHEREAS, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, the West Kern Water District made its Draft 2010 UWMP available for public inspection, and caused to be published within the jurisdiction of the West Kern Water District at least two notices of public hearing regarding the WKWD's 2010 UWMP, which publication dates included May 24, 2011 and June 7, 2011; and

WHEREAS, the West Kern Water District held its public hearing on June 28, 2011 in the Board Room of the West Kern Water District, located at 800 Kern Street, Taft CA, regarding its 2010 UWMP, wherein, among other things, members of the public and other interested entities were provided with the opportunity to be heard in connection with the District's 2010 UWMP and the proposed adoption thereof; and

WHEREAS, pursuant to said June 28, 2011 public hearing on the 2010 UWMP, the West Kern Water District encouraged the active involvement of diverse social, cultural, and economic elements of the population within the West Kern Water District's service area with regard to the preparation and adoption of the 2010 UWMP, allowed input by member of the public and any other interested party regarding all aspects of the 2010 UWMP, allowed community input regarding the District's implementation plan for complying with SBX7-7, considered the economic impacts of the District's implementation plan for complying with SBX7-7, and adopted Method 3 under Water Code section 10608.20(b) for determining the District's urban water use targets; and

WHEREAS, the Board of Directors of the West Kern Water District has reviewed and considered the purposes and requirements and of the Urban Water Management Planning Act and SBX7-7, the contents of the 2010 UWMP, the documentation contained in the administrative record in support of the 2010 UWMP, and all public and agency input received with regard to the 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence.

NOW THEREFORE, be it resolved, determined and ordered by the board of directors of the West Kern Water District as follows:

1. The Board hereby adopts Method 3 under Water Code section 10608.20(b) for determining its urban water use targets, and the 2010 Urban Water Management Plan is hereby approved and adopted and ordered filed with the Secretary of the Board.

2. The General Manager of the West Kern Water District is hereby authorized and directed to include a copy of this Resolution in the West Kern Water District's 2010 Urban Water Management Plan and, in accordance with Water Code section 10644(a), to file

the 2010 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and any city or county within which the District provides water supplies within thirty (30) days of this adoption date.

3. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the 2010 Urban Water Management Plan available for public review during normal business hours not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources.

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10635(b), to provide that portion of the 2010 Urban Water Management Plan prepared pursuant to Water Code section 10635(a) to any city or county within which the District provides water supplies not later than sixty (60) days after filing a copy thereof with the California Department of Water Resources.

5. The General Manager is hereby authorized and directed to implement the components of the 2010 Urban Water Management Plan in accordance with the Urban Water Management Planning Act and SBX7-7, including, but not limited to, the West Kern Water District's Water Conservation Programs and its Water Shortage Contingency Plan.

6. The General Manager is hereby authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2010 Urban Water Management Plan, the Urban Water Management Planning Act and SBX7-7.

All the foregoing being upon the motion of Director Morris, seconded by Director Wells, carried by the following vote:

AYES: President Gary J. Morris
Vice President David A. Wells
Director Charlie H. Comfort
Director Barry M. Jameson
Director Scott Niblett

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

ADOPTED, SIGNED AND APPROVED this 28th day of June, 2011.

GARY J. MORRIS,
President of the Board of Directors
WEST KERN WATER DISTRICT

SECRETARY'S CERTIFICATE

I, Harry O. Starkey, being the appointed secretary of the **West Kern Water District,** do hereby certify that the above and foregoing **Resolution No. 11-02** was duly adopted by the Board of Directors of said District at a legally convened meeting of said Board held on the **28th day of June, 2011,** that the above and foregoing is a full, true, and correct copy of **Resolution 11-02**, and that the same has not been amended or repealed.

ATTEST:

HARRY O. STARKEY,
Secretary of the Board of Directors
WEST KERN WATER DISTRICT

(SEAL)

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Section 1: Introduction

1.1 Overview

This volume presents the Urban Water Management Plan 2010 (Plan) for West Kern Water District (District, WKWD) service area. This chapter describes the general purpose of the Plan, discusses Plan implementation, and provides general information about WKWD service area characteristics. A list of acronyms and abbreviations is also provided.

1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of water management agencies. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (California Urban Water Management Planning Act, Article 2, Section 10630(d).) The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the plan. When specific projects are chosen to be implemented, detailed project plans are developed, environmental analysis, if required, is prepared, and financial and operational plans are detailed.

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. From this perspective, it is appropriate to look at the Plan as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands. WKWD explores enhancing basic supplies and banking of water from the State Water Project (SWP) as well as other options. These include groundwater extraction, water exchanges, and water banking/conjunctive use. Specific planning efforts will be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment, and how each option would affect

customers. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments. (WKWD is going beyond the requirements of the Act by developing a plan which spans 25 years.)
- Identifies and quantifies adequate water supplies for existing and future demands, in normal, single-dry, and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix A.

In short, the Plan answers the question: *Will there be enough water for the customers of the West Kern Water District service area in future years, and what mix of programs should be explored for making this water available?*

It is the stated goal of WKWD to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

1.3 Implementation of The Plan

This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization. Water resource specialists with expertise in water resource management were retained to assist WKWD in preparing the details of the Plan. Agency coordination for this Plan is summarized in Table 1-1.

TABLE 1-1
AGENCY COORDINATION SUMMARY

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
City of Taft	X	X		X	X	X	
City of Maricopa		X				X	
Kern County Water Agency	X	X				X	
Buena Vista WSD		X				X	
County of Kern, Council of Governments		X				X	
County of Kern		X				X	
General Public					X		

1.3.1 Public Outreach

The water agencies have encouraged community participation in water planning. For the current Plan, public sessions were held for review and to solicit input on the Draft Plan before its adoption. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the local press. Copies of the Draft Plan were made available at the water agencies' offices, local public libraries and sent to the City Taft, as well as interested parties. WKWD notified the cities and counties within its service area of the opportunity to provide input regarding the Plan. Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials are attached in Appendix B.

TABLE 1-2
PUBLIC PARTICIPATION TIMELINE

June 2, 2011	Preliminary Draft UWMP	Preliminary Draft released to solicit input
June 28, 2011	Public Hearing/Adoption Hearing	Review contents of Draft UWMP and take comments/Adopt UWMP

The components of public participation include:

Local Media

- Paid advertisements in local newspapers

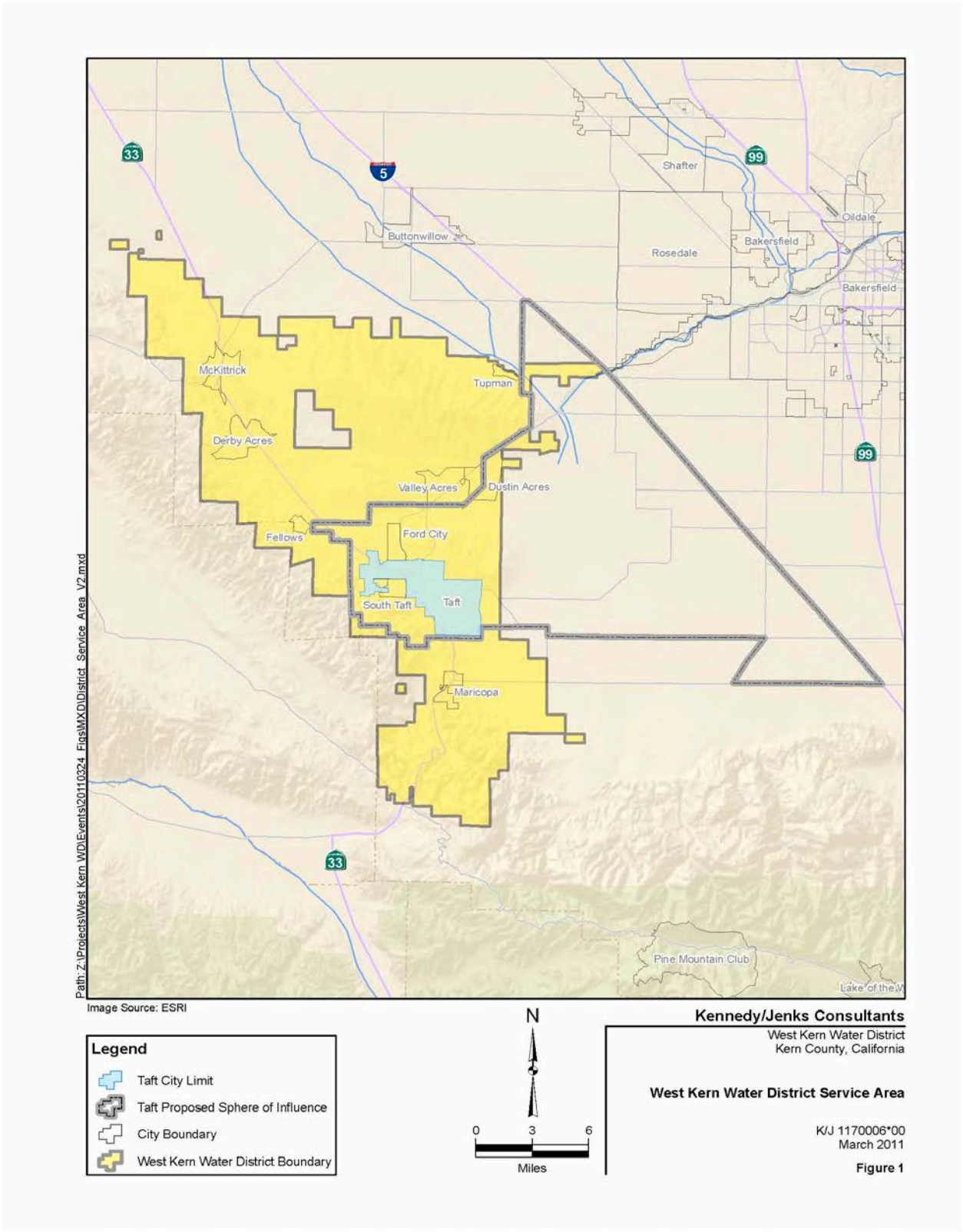
Public Availability of Documents

- West Kern Water District websites
- City Hall (City of Taft, City of Maricopa)
- Local libraries

1.4 Service Area

The West Kern Water District (WKWD) was formed in May, 1959, and includes the incorporated cities of Taft and Maricopa, together with the Westside communities of Taft Heights, South Taft, Ford City, Tupman, Dustin Acres, Valley Acres, Derby Acres, Fellows and McKittrick. The District has an irregular boundary and encompasses a service area of approximately 300 square miles. West Kern Water District is located within the San Joaquin Valley approximately 30 miles west of metropolitan Bakersfield and 100 miles north of Los Angeles. Domestic water is served to approximately 7,000 domestic accounts, with an estimated population of 18,000. Industrial water is also served to approximately 350 industrial accounts. The District primarily pumps groundwater but uses SWP water to recharge. The District also delivers up to 6,500 AF of SWP water directly from the California Aqueduct for industrial usage. The District water supply is obtained from eight groundwater wells located approximately 17 miles north east of Taft in the underflow area of the Kern River Basin. The District meters 100 percent of its service connections. The District operates on a fee for services basis, billing its industrial customers monthly and residential customers bimonthly (Figure 1-1).

FIGURE 1-1
SERVICE AREA MAP



Approximately eighty percent of the District annual water sales are served to the oil and electrical power generating industries in western Kern County. Oil companies utilize water for steam injection (referred to as "secondary recovery") which began during the mid 1960s. Electrical power generating companies began operation within the District service area during the late 1990s. Domestic water sales account for the remaining twenty percent of the District annual sales. The infrastructure needed to support these activities is described below.

The West Kern Water District consists of the following:

- 8 active groundwater wells
- 26 above ground water storage tanks
- 15 booster pump stations
- 300 miles of distribution pipe lines
- Recharge basins of approximately 500 acres

1.5 Population

The District service area includes the cities of Taft and Maricopa, together with the Westside communities of Taft Heights, South Taft, Ford City, Tupman, Dustin Acres, Valley Acres, Fellows and McKittrick. The Taft Sphere of Influence (planning area) includes the City of Taft and the unincorporated communities of South Taft, Taft Heights, and Ford City. This Sphere of Influence area accounts for the majority of the District's domestic water deliveries. Domestic water deliveries to Maricopa, Tupman, Dustin Acres, Valley Acres, Derby Acres, Fellows and McKittrick historically indicate a decline in water deliveries primarily due to a decline in population in the past several years. The District also provides water to a correctional facility which houses approximately 2,700 people.

The low population growth within Taft is highly influenced by the lack of available property. Oil companies and government agencies control the majority of the land surrounding Taft, and until recently, land for development has not been for sale.

1.6 Topography and Climate

The greater Taft area, which functions as both the population and commercial center of the District, lies against the gently rolling foothills of the Temblor Range of the Sierra Madre Mountains at an elevation varying from 900 to 1200 feet above sea level. About ten miles to the east, towards Bakersfield, the valley floor reaches a minimum elevation of 300 feet. The highest point of the District lies immediately to the south of the City of Taft, where 25 Hill reaches the height of 1,700 feet.

The climate of the southwestern portion of the San Joaquin Valley is semi-arid. The average maximum temperature in the City of Taft for the month of July is 98.6 degrees Fahrenheit, and for the month of January, 58.1 degrees Fahrenheit. The average annual rainfall is 5.53 inches. Table 1-3 presents the area's annual average climate data.

TABLE 1-3
CLIMATE DATA FOR THE WKWD SERVICE AREA

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo[(a)]	1.25	2.07	3.85	5.69	7.48	7.98
Average Rainfall (inches)[(b)]	1.12	1.35	0.75	0.53	0.37	0.03
Average Max. Temperature (Fahrenheit)[(c)]	58.1	62.4	69.9	75.3	84.6	92.0

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo[(a)]	8.23	7.40	5.78	4.11	2.04	1.18	57.06
Average Rainfall (inches)[(b)]	0.00	0.01	0.06	0.28	0.38	0.65	5.53
Average Max. Temperature (Fahrenheit)[(c)]	98.6	97.4	91.8	79.6	66.1	58.4	77.9

Notes:
(a) ETo (evapotranspiration) data: Station 5 Shafter/USDA station, http://wwwcimis.water.ca.gov/cimis/welcome.jsp
(b) Average Monthly Rainfall data gathered from long-term average precipitation records from Taft gage (048752) during period 1948-2010. http://www.wrcc.dri.edu/
(c) Temperature data from long-term average precipitation records from Taft gage (048752) during period 1948-2010, http://www.wrcc.dri.edu/

1.7 Potential Effects of Global Warming

A topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies. Climate change models have predicted that potential effects of global warming will result in increased temperature, reduction in Sierra Nevada snowpack depth, early snow melt, and a rise in sea level. In the 2009 update of the *California Water Plan*, multiple scenarios of future climate conditions are evaluated. These changing hydrological conditions could affect future planning efforts, which are typically based on historic conditions.

In June 2005, Governor Arnold Schwarzenegger issued Executive Order S-3-05, which requires biennial reports on climate change impacts in several areas, including water resources. The Climate Action Team (CAT) was formed in response to executive order S-3-05. To help unify analysis across topic areas, the CAT worked with scientists from the California Applications Program's California Climate Change Center to select a set of future climate projections to be used for analysis. For the 2008-2009 assessment of climate change impacts, the CAT selected six different global climate change models, assuming two different greenhouse gas emission levels (a high end and a low end), for a total of 12 scenarios. The results of the study indicated that climate change has already been observed, in that in the last 100 years, air temperatures have risen about 1 degree Fahrenheit, and there has been a documented greater variance in precipitation, with greater extremes both in terms of heavy flooding and severe droughts.

In July 2006, DWR issued "*Progress on Incorporating Climate Change into Management of California's Water Resources*," as required by Executive Order S-3-05. That report demonstrated how various analytical tools could be used to address issues related to climate change. The results of these scenarios were also utilized by DWR to evaluate the potential affects of climate change on SWP supply reliability in the *Draft State Water Project Delivery Reliability Report 2009*. This analysis presents potential impacts on SWP operations, including reservoir inflows, delivery reliability, and average annual carryover storage, as well as many other operational parameters. Some of the main impacts include: changes to south of Delta SWP deliveries (from an increase of about 1 percent in a wetter climate change scenario to about a 10 percent reduction for a drier scenario); increased winter runoff and lower SWP

allocations in the three driest scenarios; lower carryover storage in drier scenarios; and higher carryover storage in a wetter scenario.

In August 2009, DWR issued its next step in understanding climate change, "*Using Future Climate Projections to Support Water Resources Decision Making in California",* sponsored by the California Energy Commission (Energy Commission) and the California Environmental Protection Agency (Cal/EPA). This report updates the work done in 2006, and advances a better understanding of how well current models represent historical climate conditions in California that can affect water resources, such as air temperature, precipitation, and streamflow, and the subsequent translation into decision making, water resource planning, and water resource impact analyses.

Twelve climate projections are used to assess the reliability of Central Valley Project (CVP) and SWP operations. This information is particularly useful for addressing the implications and considerations of climate change on changing hydrology which were that increasing air temperatures will significantly affect watershed hydrology, including runoff and precipitation. Another conclusion is that climate change is expected to reduce the reliability of SWP and CVP water supplies (by up to 19 percent by mid-century and by 33 to 38 percent at the end of the century), both of which are related to the Kern Region's imported water supplies.

Since WKWD is reliant on imported SWP supplies as part of its overall supply mix, any reduction or change in the timing of availability of those supplies could have negative impacts on the water supply of the Kern County region. Reductions in the quantity of SWP water available would force the Kern County region to rely more heavily on local groundwater and local surface flows, or other sources of imported water. It is possible that local surface flows could also be reduced by changes in snow pack altitude levels and/or quantity of snow pack in the Sierra Nevada and other regional mountain ranges, which would reduce natural recharge, thus exacerbating local groundwater availability problems.

The Global Warming Solutions Act of 2006 (AB 32), has committed California to reducing the state's greenhouse gas emissions to 2000 levels by 2010 (approximately 11 percent below current levels), to 1990 levels by 2020 (approximately 25 percent below business as usual), and to 80 percent below 1990 levels by 2050. The California Air Resources Board (CARB) is charged with developing the appropriate regulations and reporting system to effectively implement the caps on emissions.

The California Natural Resources Agency has identified several climate change adaptation strategies for water management systems. One of the primary strategies is the preparation of integrated regional water management plans. Other adaptation strategies identified by the California Natural Resources Agency include: aggressive water use efficiency in urban and agricultural sectors; use of recycled water; integrated flood management; development of a Central Valley Flood Protection Plan; local emergency flood preparedness; land use policies to decrease flood risk; establishment of flood plain corridors; and protection of recharge areas.

The 2009 California Water Plan Update identifies the following probable impacts due to changes in temperature and precipitation:

- Decrease in snowpack, which is a major part of annual water storage, due to increasing winter temperatures

- More winter runoff and less spring/summer runoff due to warmer temperatures
- Greater extremes in flooding and droughts
- Greater water demand for irrigation and landscape water due to increased temperatures and their impacts on plant water needs
- Increased sea level rise, further endangering the functions of the SWP, which depends on movement of water through the low-lying channels of the low-lying Sacramento-San Joaquin Delta. Sea level rise could also require the SWP to release additional storage water to avoid sea water intrusion into the Delta.

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Outdoor water use is a large component of Kern County water demands. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand. All twelve climate change scenarios evaluated in the *Draft State Water Project Delivery Reliability Report 2009*, anticipate higher annual water demands than would occur with a repeat of historical climate.

1.8 List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
Act	California Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
BMPs	Best Management Practices
BVWSD	Buena Vista Water Storage District
CARB	California Air Resources Board
CAT	Climate Action Team
CCF	One Hundred Cubic Feet
CCR	Consumer Confidence Report
CEQA	California Environmental Quality Act
CDPH	California Department of Public Health
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DBP	Disinfection by-products
Delta	Sacramento-San Joaquin Delta
DHS	California Department of Health Services
DMM	Demand Management Measures
DOF	Department of Finance
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Electrical conductivity
EDT	Electronic Data Transfer

EPA	Environmental Protection Agency
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GWMP	Groundwater Management Plan
HCD	State Department of Housing and Community Development
HECW	High-Efficiency Clothes Washers
HET	High Efficiency Toilet
KCWA	Kern County Water Agency
M&I	Municipal and Industrial
MCL	Maximum Contaminant Limit
MAF	million acre-feet
mgd	million gallons per day
mg/L	milligrams per liter
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas and Electric
PWSS	Public Water System Statistics
RHNA	Regional Housing Needs Allocation Plan
RWQCB	Regional Water Quality Control Board
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SMCL	Secondary Maximum Contaminant Limit
SWP	State Water Project
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
UWMP	Urban Water Management Plan
WHPA	Wellhead Protection Area
WKWD	West Kern Water District
WSRP	Water Shortage Response Plan
WSS	WaterSense Specification

Section 2: Water Use

2.1 Overview

This chapter describes historic and current water usage and the methodology used to project future demands within WKWD's service area. Water usage is divided into sectors such as residential, industrial, institutional, landscape, agricultural, and other purposes. WKWD completes the Public Water System Statistics (PWSS) form which is submitted to DWR annually. These annual reports served as the basis for the demand analysis in this chapter. To undertake the demand analysis, water unit factors per person for domestic and per connection for industrial were determined based on 2009 data. The number of new connections for residential and industrial was projected based on the average past growth from 1995-2010.

Several factors can affect demand projections, including:

- Land use revisions
- New regulations
- Consumer choice
- Economic conditions
- Transportation needs
- Highway construction
- Environmental factors
- Conservation programs
- Plumbing codes

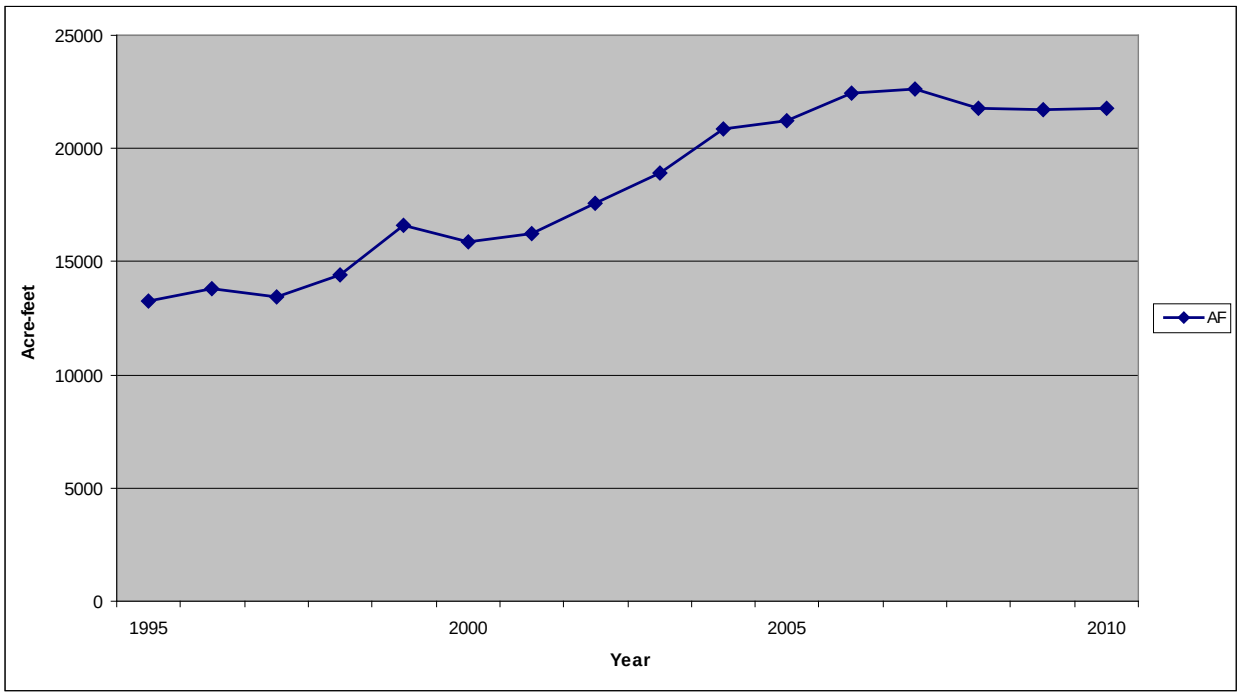
The foregoing factors affect the amount of water needed, as well as the timing of when it is needed. Past experience has indicated that the economy is the biggest factor in determining water demand projections. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future plumbing codes or other regulatory changes. There have been, and continue to be, major efforts statewide to conserve water, which have been successful.

2.2 Historic Water Use

Predicting future water supply requires accurate historic water use patterns and water usage records. Both the economy and entitlement process (compliance with the California Environmental Quality Act [CEQA]) are key factors impacting growth in population and demand.

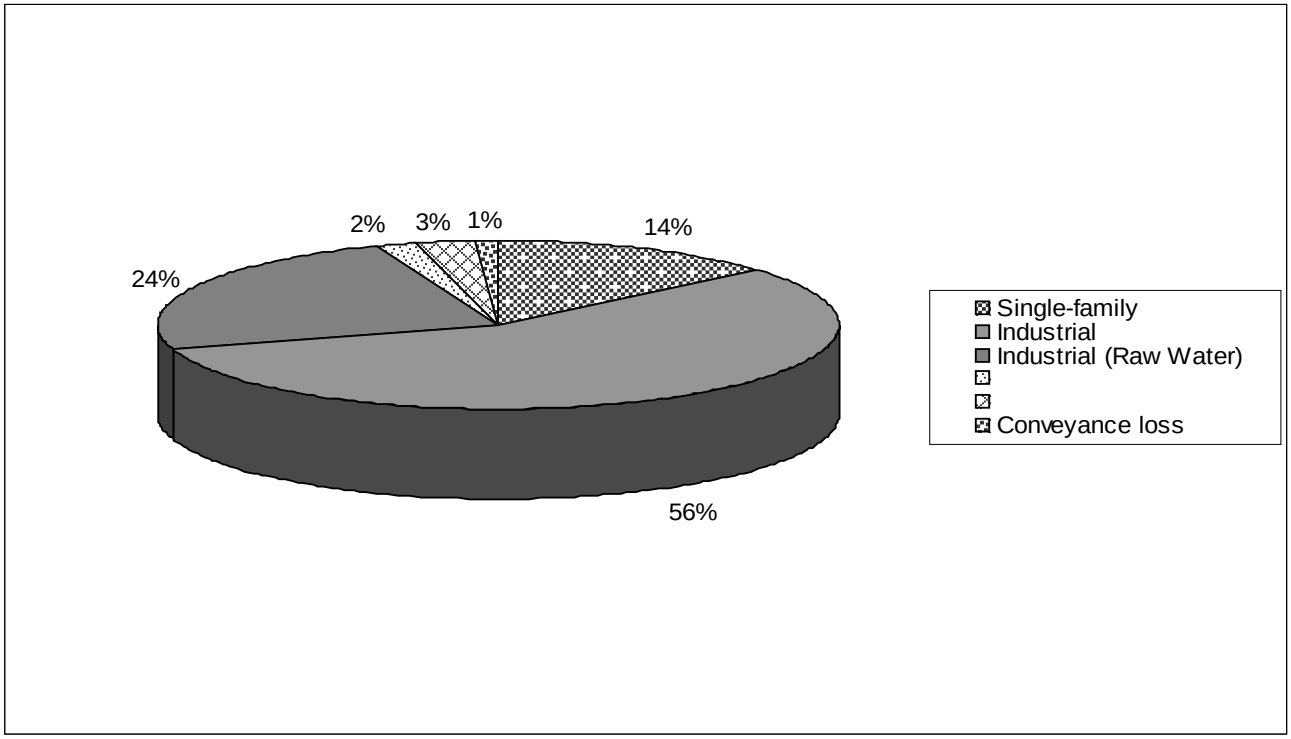
Figure 2-1 presents the historical accounts and deliveries by WKWD since 1995. The type of customer accounts included in the table are single family homes, multi-family homes, commercial, industrial, institutional/government, landscape and agriculture.

FIGURE 2-1
HISTORICAL DELIVERIES



Historical deliveries have increased slightly over the past 15 years. Demand from the various sectors has remained relatively constant. WKWD provides water predominately to industrial customers (Industrial and La Paloma raw water) represented by approximately 80 percent of the demand (Figure 2-2).

FIGURE 2-2
WATER DEMANDS FOR EACH CUSTOMER CLASS



2.3 Projected Water Use

2.3.1 Projections

WKWD maintains historical data, as well as works closely with the cities, property owners and developers in their service area, to ensure adequate water supply is available and the necessary infrastructure to provide water service. Table 2-1 below is based on the water unit factor per person and the projected population. Industrial demand was based on a water unit factor and past growth of that sector. Past growth of the industrial sector has been minimal and is not expected to expand greatly and therefore this sector will remain relatively constant. WKWD pumps nearly all water from the groundwater basin with the exception of La Paloma. WKWD's deliveries to residential are small compared to the demand from their industrial clients with nearly 80 percent of the water in the distribution system delivered to industrial clients.

Table 2-1 shows the projected demand for the planning period with and without conservation. WKWD will need to reduce urban use by approximately 10 percent to achieve their 20x2020 goal with an interim reduction represented by 5 percent on domestic use. The reductions were calculate based on the domestic use and not industrial as SBX7-7 allows for all industrial uses to be subtracted from gross water use. Therefore demand reductions are realized in the domestic supply. Table 2-2 summarizes the projected water demands with conservation through 2035. Table 2-3 presents the past, current, and projected potable water deliveries by customer type for the WKWD service area.

TABLE 2-1
PROJECTED WATER DEMAND WITH AND WITHOUT CONSERVATION

Year	2010	2015[a]	2020[b]	2025	2030	2035
Demand without conservation	24,729	28,403	28,505	28,608	28,712	28,819
Demand with conservation	-	26,983	27,080	27,177	27,275	27,373

Notes:
(a) Represents a 5 percent in reduction in domestic use for interim goal.
(b) Represents an overall 10 percent reduction in domestic use for 20x2020 goal.

TABLE 2-2
CURRENT AND PROJECTED WATER DEMANDS FOR EACH CUSTOMER CLASS

Water Use Sector	2010	2015	2020	2025	2030	2035
Single-family	3,705	4,295	4,119	4,209	4,300	4,531
Multi-family	0	0	0	0	0	0
Commercial	0	0	0	0	0	0
Industrial	15,441	14,641	14,914	14,919	14,925	15,065
Institutional/governmental	465	465	465	465	465	465
Landscape	812	812	812	812	812	812
Agriculture	0	0	0	0	0	0
Raw Water (La Paloma)[a]	4,059	6,500	6,500	6,500	6,500	6,500
Conveyance loss[b]	247	270	271	272	273	274
Total	**24,729**	**26,983**	**27,080**	**27,177**	**27,275**	**27,373**

Notes:
(a) La Paloma deliveries represent SWP water and are diverted directly from the aqueduct therefore does not enter the distribution system.
(b) Conveyance loss is based on past reports and monitoring of conveyance loss. The current loss rate was calculated at 1.5 percent.

TABLE 2-3
CURRENT AND PROJECTED WATER DEMANDS FOR POTABLE SUPPLY

Water Use Sectors	2005				2010				2015			
	metered		unmetered		metered		unmetered		metered		unmetered	
	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	7,201	4,457	0	0	7,119	3,705	0	0	7,241	4,295	0	0
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	297	15,357	0	0	354	15,688	0	0	354	14,641	0	0
Institutional/ governmental	0	465	0	0	0	465	0	0	0	465	0	0
Landscape	0	812	0	0	0	812	0	0	0	812	0	0
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	3,472	0	0	1	4,059	0	0	1	6,500	0	0
Conveyance loss										270		
Total	**7,498**	**24,563**	0	0	**7,474**	**24,729**	0	0	**7,596**	**26,983**	**0**	**0**

TABLE 2-3 (CON'T)
CURRENT AND PROJECTED WATER DEMANDS FOR POTABLE SUPPLY

Water Use Sectors	2020				2025				2030			
	metered		unmetered		metered		unmetered		metered		unmetered	
	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Water Use Sectors	7,365	4,119	0	0	7,491	4,209	0	0	7,619	4,300	0	0
Single family	0	0	0	0	0	0	0	0	0	0	0	0
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	354	14,914	0	0	355	14,919	0	0	355	14,925	0	0
Industrial	0	465	0	0	0	465	0	0	0	465	0	0
Institutional/ governmental	0	812	0	0	0	812	0	0	0	812	0	0
Landscape	0	0	0	0	0	0	0	0	0	0	0	0
Agriculture	1	6,500	0	0	1	6,500	0	0	1	6,500	0	0
Conveyance Loss	-	271	-	0	-	272	0	0	-	273	0	0
Total	**7,720**	**27,080**	**0**	**0**	**7,847**	**27,177**			**7,975**	**27,275**		

TABLE 2-3 (CON'T)
CURRENT AND PROJECTED WATER DEMANDS FOR POTABLE SUPPLY

	2035 opt			
	metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	7,749	4,531	0	0
Multi-family	0	0	0	0
Commercial	0	0	0	0
Industrial	355	15,065	0	0
Institutional/governmental	0	465	0	0
Landscape	0	812	0	0
Agriculture	0	0	0	0
Other	1	6,500	0	0
Conveyance Loss	-	274	0	0
Total	**8,105**	**27,373**		

2.3.2 Projections based on service area growth

2.3.3 Methodology

WKWD sees very little growth due to limited water supplies and maintaining a positive balance for banking in the basin. As the region is arid, recharge is dependent on SWP thus placing constraints on the supply resulting in limited new development and population influx. Projected populations were based on projected persons per connection and historical residential connections. The 2000 Census from Kern Council of Governments was the basis for the persons per connections. A rate of increase was based on DOF data from 1995 to 2010 to project the rate of increase while a rate of increase for connections was based on the past increases from those same years. Table 2-4 shows the projected population in which little growth is observed.

TABLE 2-4
POPULATION PROJECTIONS

	2010	2015	2020	2025	2030	2035	Data Source
Service Area Population[(a)]	18,048	18,413	18,785	19,164	19,552	19,948	Kern COG 2000 census data

Note:
(a) Data source- Kern Council of Governments Census Data

2.4 Water Conservation Act Of 2009

2.4.1 SBX7-7

As described in Senate Bill 7 of Special Extended Session 7 (SBX7-7), it is the intent of the California legislature to increase water use efficiency and the legislature has set a goal of a 20 percent per capita reduction in urban water use statewide by 2020. SBX7-7 requires that retail water suppliers comply with its requirements. Consistent with SBX7-7, the 2010 UWMP must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in the previous section. Base gross water use is defined as the total volume of water, treated or untreated, entering the distribution system, excluding: recycled water; net volume of water placed into long-term storage; and water conveyed to another urban water supplier.

The UWMP Act allows urban water retailers to evaluate their base daily per capita water use using a 10 or 15-year period. A 15-year base period within the range January 1, 1990 to December 31, 2010 is allowed if recycled water made up 10 percent or more of the 2008 retail water delivery. If recycled water did not make up 10 percent or more of the 2008 retail water delivery, then a retailer must use a 10-year base period within the range January 1, 1995 to December 31, 2010. Recycled water did not make up 10 percent of the 2008 delivery to and for this reason Base Daily Per Capita Water Use has been based on a 10-year period. In addition, urban retailers must report daily per capita water use for a five year period within the range January 1, 2003 to December 31, 2010. This 5-year base period is compared to the Target Based Daily Per Capita Water Use to determine the minimum water use reduction requirement.

WKWD has a unique water profile with approximately 80% of the water delivered to industrial customers. Per DWR guidelines for the calculation of gpcd, WKWD is permitted to subtract all process water and industrial demand from total production to determine gross water use. The numbers in table 2-5 do not include the 6,500 AF water from La Paloma as this water is directly diverted from the aqueduct prior to the water entering WKWD's distribution system. Industrial customers have been served by WKWD for more than forty years and so WKWD subtracted industrial process water from all base period years for the SBX7-7 calculations.

TABLE 2-5
PROCESS WATER DEDUCTIONS

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total production AF	15,906	16,236	17,574	18,911	20,883	21,239	22,457	22,612	21,788	21,740
Residential production AF	3,181	3,247	3,515	3,782	4,177	4,248	4,491	4,522	4,358	4,348
CII production AF	12,725	12,989	14,059	15,129	16,706	16,991	17,966	18,090	17,430	17,392

WKWD serves several large energy industries including the oil industry and electrical co-generation.

- **Oil Industry**
  Oil producing operations have provided the majority of the District's water sales for more than forty years. Oil production in western Kern County relies heavily on the injection of steam into the oil bearing formations to enhance the recovery of oil. Steam injection is required due to the oil's low gravity, which reduces its ability to flow or to be pumped to the surface. Once the steam is injected into the formation the steam condenses and forms an oil/water emulsion, which can be pumped or lifted back to the earth's surface.

- **Electrical Co-Generation**
  The electrical co-generation industry utilizes steam or natural gas, which power turbines to generate electricity. Both systems require a large amount of water to generate steam or water for cooling tower operations. Where steam is used to turn the turbine, the steam will pass through the turbines up to seven times before the steam degrades to a quality which it can no longer be used. Once the steam becomes unsuitable, it is necessary to purchase additional water to produce new steam.

- **Golf Courses**
  Golf courses are also classified as "industrial" use. There is one major golf course in the service area that uses about 870 AFY.

Table 2-6 through 2-7 summarizes the gallons per capita per day (gpcd) in for the compliance with SBX7-7. The data developed in this table is derived from the total annual demand as reported by WKWD divided by the historical population. The population was calculated using the 2000 Census and the method found in Appendix A of methodologies for *Calculating Baseline and Compliance Urban Per Capita Water Use* from DWR. The current estimated water use is 216 gpcd. The calculated baseline is 200 gpcd with a 2020 target of 170 gpcd. WKWD recently prepared a water use efficiency plan as described in Chapter 7 to achieve the target by 2020.

TABLE 2-6
BASE PERIOD RANGES

Base	Parameter	Value	Units
10 year base period	2010 total water deliveries	4200	AF
	2010 total volume of delivered recycled water	0	AF
	2010 recycled water as a percent of total deliveries	0	percent
	Number of years in base period	10	years
	Year beginning base period range	2000	
	Year ending base period range	2009	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2005	
	Year ending base period range	2009	

In addition to calculating base gross water use, SBX7-7 requires that WKWD identify their demand reduction targets for year 2015 and 2020 by utilizing one of four options:

- Option 1. 80 percent of baseline gpcd water use (i.e., a 20 percent reduction).
- Option 2. The sum of the following performance standards: indoor residential use (provisional standard set at 55 gpcd); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (80 percent ETo existing landscapes, 70 percent of ETo for future landscapes); plus 10 percent reduction in baseline commercial, industrial institutional use by 2020.
- Option 3. 95 percent of the applicable state hydrologic region target as set in the DWR "20x2020 Water Conservation Plan" (February, 2010) (20x2020 Plan).
- Option 4. Savings by Water Sector: this method identifies water savings obtained through identified practices and subtracts them from the base daily per capita water use value identified for the water supplier.

Option 2 and Option 4 were considered and not selected because they required data not currently being collected within the WKWD service area.

The WKWD service area is within the Tulare Lake Region; this hydrologic region has been assigned a 2020 water use target of 179 gpcd per the DWR 20x2020 Water Conservation Plan (February 2010). Option 3 requires a target of 95 percent of the 179 gpcd target, or 170 gpcd. WKWD chose this option to determine its target.

The calculation for the 2020 gpcd targets for WKWD are shown in Tables 2-7 to 2-8.

TABLE 2-7
BASE DAILY PER CAPITA WATER USE 10 YEAR RANGE

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily per Capita Water Use (gpcd)
Sequence Year	**Calendar Year**			
Year 1	1995	17040	2.36	138.7
Year 2	1996	16871	2.47	146.4
Year 3	1997	16866	2.40	142.5
Year 4	1998	16698	2.58	154.2
Year 5	1999	16756	2.97	177.1
Year 6	2000	16778	2.84	169.3
Year 7	2001	16725	2.90	173.3
Year 8	2002	17805	3.14	176.2
Year 9	2003	17801	3.38	189.7
Year 10	2004	17955	3.73	207.7
Year 11	2005	18052	3.79	210.1
Year 12	2006	18273	4.01	219.4
Year 13	2007	18223	4.04	221.5
Year 14	2008	17950	3.89	216.7
Year 15	2009	17961	3.88	216.1
		Base Daily Per Capita Water Use		200

Note: Shaded cells indicate selected ten-year base period.

TABLE 2-8
BASE DAILY PER CAPITA WATER USE 5 YEAR RANGE

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	**Calendar Year**			
Year 1	2005	18052	3.79	210.1
Year 2	2006	18273	4.01	219.4
Year 3	2007	18223	4.04	221.5
Year 4	2008	17950	3.89	216.7
Year 5	2009	17961	3.88	216.1
		Base Daily Per Capita Water Use		205.9

The baseline and 2020 target are presented in Table 2-9. To date, WKWD has not met the 2020 target and Section 7 of this UWMP provides the plan WKWD has developed to achieve and maintain this target.

TABLE 2-9
BASELINE, TARGET, AND CURRENT GPCD

	GPCD
Baseline gpcd	200
Target 2020 gpcd [(a)]	170
Interim 2015 gpcd	185
Current 2009 gpcd	216

Note:
(a) Target Method 3 is used.

2.5 Other Factors Affecting Water Usage

Major factors that affect water usage are weather and water conservation. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool-wet years, historical water usage has decreased to reflect less water usage for external landscaping. Water conservation measures employed within the WKWD service area will have a direct long-term effect on water usage.

2.5.1 Conservation Effects on Water Usage

In recent years, water conservation has become an increasingly important factor in water supply planning in California. The California plumbing code has instituted requirements for new construction that mandate the installation of ultra low-flow toilets and low-flow showerheads. WKWD continues to support the development water conservation measures and continually improve upon the conservation plan. Programs supported by WKWD include public information and education programs, metering programs, conservation coordination, water waste prevention, implementation of AWWA M36 methodology, and conservation pricing. A complete description of these programs and their implementation can be found in Section 7.

Residential, commercial, and industrial usage can be expected to decrease as a result of the implementation of more aggressive water conservation practices. As previously discussed, the greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation especially in WKWD's service area where the evapotranspiration rate is high. The irrigation demand can represent as much as 50 percent of the water demand for residential customers depending upon lot size and amount of irrigated turf and plants.

2.6 Low Income Projected Water Demands

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county general plan in the service area of the supplier.

Housing elements rely on the Regional Housing Needs Allocation Plan (RHNA) generated by the State Department of Housing and Community Development (HCD) to allocate the regional need for housing to the Kern Council of Governments (COG) for incorporation into housing element updates. Before the housing element is due, the HCD determines the total regional

housing need for the next planning period for each region in the state and allocates that need. The COGs then allocate to each local jurisdiction its "fair share" of the RHNA, broken down by income categories; very low, low, moderate, and above moderate, over the housing element's planning period.

The housing elements cover the planning period 2006-2013. The allocation for very low and low income classes as defined by the California Health and Safety Code were the following for Kern County:

- Very Low – 24.3 percent
- Low – 16.5 percent

The Kern RHNA combines single-family and multi-family residential housing units within the allocation of low income households. For this reason, it is not possible to project water use for lower income households by this specific land use category. However, to remain consistent with the intent of the SB1087 legislation and also to comply with the UWMP Planning Act, intent has been made to identify those water use projections for very low- and low- residential income households based on the income category, classification percentage, calculated demand projections as shown in Table 2-9 below.

Note that the current planning period for the RHNA is January 1, 2006 to June 30, 2013. The next RHNA planning cycle will cover January 1, 2011 to September 30, 2021. Thus, the 2015 UWMP update will need to be updated with the next RHNA planning cycle and allocation of low income category percentages.

WKWD will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households.

TABLE 2-10
LOW INCOME WATER DEMAND

	2010	2015	2020	2025	2030	2035
Residential demand[(a)]	4,295	4,119	4,209	4,300	4,531	4,820
Very low income[(b)]	1,044	1,001	1,023	1,045	1,101	1,081
Low income[(b)]	708	680	694	710	748	734
Total low income demand	**1,752**	**1,681**	**1,717**	**1,754**	**1,849**	**1,815**

Notes:
(a) Demand from Table 2-2
(b) Regional Housing Needs Assessment – Planning Period (January 1, 2006 - June 30, 2013) for Kern Council of Governments http://www.kerncog.org/docs/housing/RHNA.pdf

Section 3: Water Resources

3.1 Overview

This section describes the water resources available to WKWD for the 25-year period covered by the Plan. These are summarized in Table 3-1 and discussed in more detail below. Both currently available and planned supplies are discussed. Due to short term agreements, WKWD has additional water which can be banked through 2020; future supplies do not currently have excess water for banking and groundwater will be pumped to meet demand.

TABLE 3-1
CURRENT AND PROJECTED SUPPLY

Water Supply Sources- AFY							
Water purchased from :	**Wholesaler supplied volume (yes/no)**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035-opt**
Kern County Water Agency (SWP)[(a)]	Yes	15,750	18,900	18,900	18,900	18,900	18,900
Groundwater							
Kern River Alluvial Fan (WKWD Bank Extraction)	No	0	0	0	1,777	1,875	1,973
Supplier-produced surface water		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges in							
Rosedale-Rio Bravo[(b)]	No	10,000	11,666	11,666			
Recycled water		0	0	0	0	0	0
Desalinated water		0	0	0	0	0	0
Additional Source[(c)]	No	10,279					
Tehachapi Cummings			2,000				
Palmdale Water District			3,000				
Buena Vista Water Storage District			6,500	6,500	6,500	6,500	6,500
Total		36,029	42,066	37,066	27,177	27,275	27,373
Potential water for banking		5,559	15,083	9,986	0	0	0

Notes:
(a) Projected quantities are based on DWR's future delivery estimates of 60 percent. WKWD receives 31,500 from KCWA's Table A allotment.
(b) Contract ends 2018
(c) State and Federal water purchased for groundwater recharge.

The term "dry" is used throughout this chapter and in subsequent chapters concerning water resources and reliability as a measure of supply availability. As used in this Plan, dry years are those years when supplies are the lowest, which occurs primarily when precipitation is lower than the long-term average precipitation. The impact of low precipitation in a given year on a particular supply may differ based on how low the precipitation is, or whether the year follows a

high-precipitation year or another low-precipitation year. For the SWP, a low-precipitation year may or may not affect supplies, depending on how much water is in SWP storage at the beginning of the year. Also, dry conditions can differ geographically. For example, a dry year can be local to the area (thereby affecting local groundwater replenishment and production), local to northern California (thereby affecting SWP water deliveries), or statewide (thereby affecting both local groundwater and the SWP). When the term "dry" is used in this Plan, statewide drought conditions are assumed, affecting both local groundwater and SWP supplies at the same time.

3.2 Wholesale (Imported) Water Supplies

3.2.1 Imported Water Supplies

The SWP is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most initial facilities completed by 1973. Today, the SWP includes 28 dams and reservoirs, 26 pumping and generating plants, and approximately 660 miles of aqueducts. The primary water source for the SWP is the Feather River, a tributary of the Sacramento River. Storage released from Oroville Dam on the Feather River flows down natural river channels to the Sacramento-San Joaquin River Delta (Delta). While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains and the aqueduct then divides into the East and West Branches.

In the early 1960s, DWR began entering into individual SWP Water Supply Contracts with urban and agricultural public water supply agencies located throughout northern, central, and southern California for SWP water supplies. Kern County Water Agency (KCWA) is one of 29 water agencies (commonly referred to as “contractors”) that have a SWP Water Supply Contract with DWR. Each SWP contractor’s SWP Water Supply Contract contains a “Table A,” which lists the maximum amount of water an agency may request each year throughout the life of the contract. Table A is used in determining each contractor’s proportionate share, or “allocation,” of the total SWP water supply DWR determines to be available each year. The total planned annual delivery capability of the SWP and the sum of all contractors’ maximum Table A amounts was originally 4.23 million acre-feet (MAF). The initial SWP storage facilities were designed to meet contractors’ water demands in the early years of the SWP, with the construction of additional storage facilities planned as demands increased. However, essentially no additional SWP storage facilities have been constructed since the early 1970s. SWP conveyance facilities were generally designed and have been constructed to deliver maximum Table A amounts to all contractors. After the permanent retirement of some Table A amount by two agricultural contractors in 1996, the maximum Table A amounts of all SWP contractors now totals about 4.17 MAF.

WKWD contracted with KCWA in 1966 to receive an allotment of water through the SWP. KCWA holds a master contract with the State to receive water from the SWP. WKWD and 15 other local water districts, called member units, subcontract with KCWA. Currently, KCWA’s annual Table A amount is 998,730 AF; of that amount WKWD is allocated 31,500 AFY. While these amounts represent the maximum amount of water that these two agencies can request, DWR determines the amount that will actually be delivered in a given year. In the 2009 State

Water Project Delivery Reliability Report, DWR's average year long-term SWP delivery was determined to be 60 percent of Table A Amounts. These most recent analyses also project that SWP deliveries during multiple-year dry periods could average about 34-36 percent of total Table A amounts and could possibly be as low as 7-11 percent during an unusually dry single year.

During wet years when high-flow water is available, an additional 10,000 acre-feet per year (AFY) is available to WKWD. Historically, this high-flow water has been purchased or exchanged by WKWD to increase the water banking program. The surface water indirectly available to WKWD consists of in-lieu surface water delivered to BVWSD and credited to WKWD for recharge. This water is either SWP water or high-flow Kern River water. The surface water is not currently used as a domestic water supply source.

WKWD also has two turnouts along the California Aqueduct that have been used to deliver untreated water directly to industrial customers. Currently only one of the turnouts is operated by the District, which supplies untreated water to La Paloma Power Co. LLC (La Paloma). An agreement was established in 2001 between WKWD and La Paloma for a maximum delivery of 6,500 AFY. Historically La Paloma has taken less than 6,500 AFY and WKWD utilizes the balance of the water for recharge to its water banking program or exchanges with other entities.

3.3 Groundwater

This section presents information about WKWD's supplies, including a summary of the adopted Groundwater Management Plan.

3.3.1 Groundwater Basin

WKWD is located within the Tulare Lake Hydrologic Region, San Joaquin Valley Groundwater Basin (see Table 3-2). The region has 12 distinct groundwater basins and 7 subbasins of the San Joaquin Valley Groundwater Basin; Kings, Westside, Pleasant Valley Kaweah, Tulare Lake, Tule, and Kern County which crosses north into the San Joaquin River HR. The interconnected depositional basins are grossly separated by a basement high known as the Bakersfield Arch, which trends roughly along and parallel to the Kern River. According to Department of Water Resources, California Bulletin 118, the basin is in a water- short condition. It is also a non-adjudicated basin. It receives its recharge from the Kern River which traverses through a wide, flat, bed. In the riverbed are 500 to 2,000 foot thick poorly sorted deposits of silt, sand, rock, and clay that originated from the Sierra Nevada, and that provide moderate to high permeability through the riverbed. Historically, flood flows that overflowed on lands on both sides of the river contributed further to groundwater recharge. Although natural recharge is primarily from stream seepage along the eastern subbasin and the Kern River; recharge of applied irrigation water, is the largest contributor to the recharge of the subbasin.

TABLE 3-2
SAN JOAQUIN VALLEY GROUNDWATER BASIN

Groundwater Basin	DWR Groundwater Basin Number	Surface Area (acres)	Groundwater Storage Capacity (1,000 AF)
San Joaquin Valley Groundwater Basin	5-22.14	1,945,000	4,000

The southern-half of the basin, of which the District is a part, is referred to as the San Joaquin Valley. The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The geologic history and geometry of the valley is one of a continually sinking basin being filled with sediment. The sediment was supplied to the basin by the rising Coast Ranges (San Emigdio Mountains), the Transverse Ranges (Tehachapi Mountains), and the Sierra Nevada. The District produces groundwater from its wellfield in the Tupman area, about 15 miles northeast of Taft. The geologic units underlying the valley, and which are present underneath the District's wellfield area, are generally grouped into three broad categories. These include the crystalline rocks of ·pre-Tertiary age (> 65 million years old), the marine sedimentary rocks of Tertiary age (from 65 million to roughly 20 million years old), and the continental sedimentary deposits of Tertiary and Quaternary age (20 million years old to present). Generally, the crystalline rocks and the marine deposits are nonwaterbearing rocks in this area, and play no significant role in the ability of the District to produce groundwater.

Overlying the crystalline rocks and the marine sedimentary rocks is a thick sequence of continental, semi-consolidated to unconsolidated sediments. These continental sediments are several thousand feet thick in the thickest portions of the basin, near the central part of the San Joaquin Valley. Along the fringe of the basin, or on top of the Bakersfield Arch, the sediments are considerably thinner.

In the area of the District's wellfield, the continental rocks consist of the Plio-Pleistocene Tulare Formation, a thick sequence of water-Iaiden sands, silts, and clays. Throughout much of the San Joaquin Valley, the Tulare Formation contains a regionally extensive lacustrine or lakebed clay, generally referred to as Corcoran Clay, that serves as a confining layer separating the shallow semi-confined to unconfined aquifer system from a deeper confined aquifer system. The water-producing portion of the groundwater basin is within the upper sections of the continental deposits and the overlying alluvium. The hydro geology of the basin above the base of fresh water is an alluvial fan complex deposited by the Kern River.

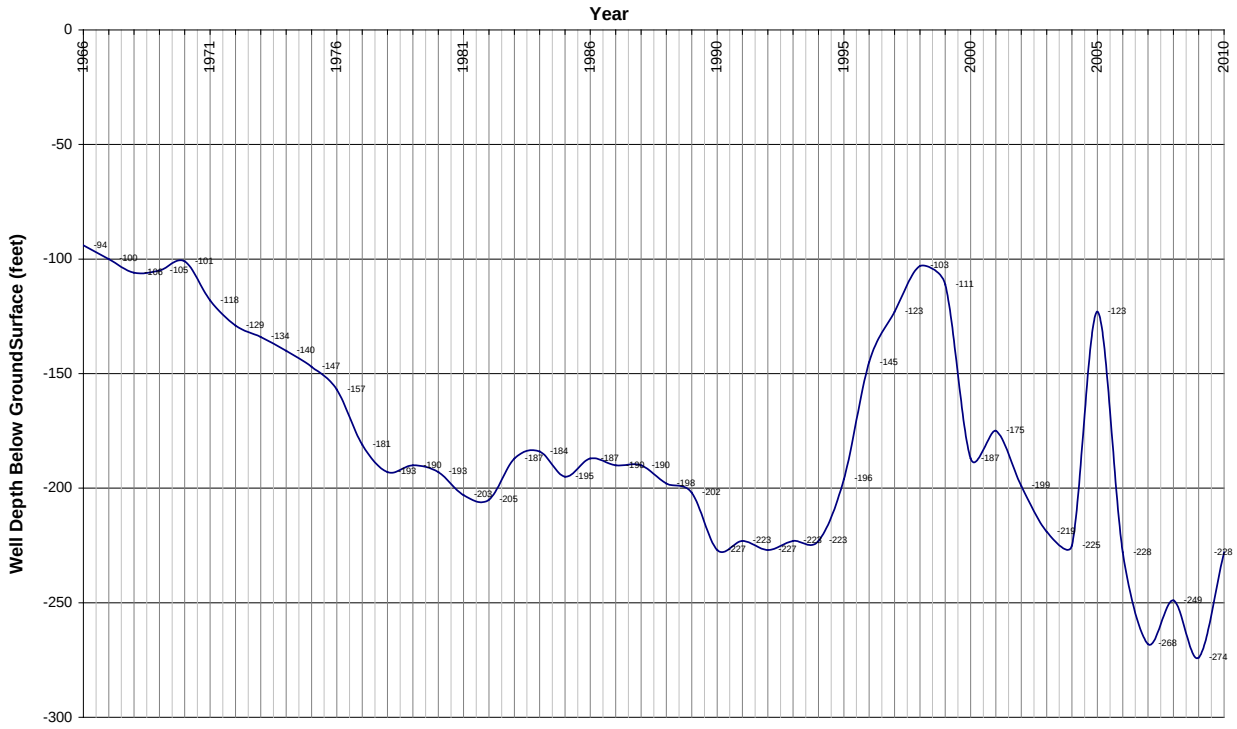
3.3.2 Groundwater Levels

Water levels in WKWD well fields have steadily declined over the past 40 years. Continued drought has driven the groundwater levels in the basin increasingly deeper. The District experienced its lowest pumping levels to date in 2009 reaching depths of 274 feet below ground surface (bgs). Current high static water levels were experienced during 2006 at 123 feet bgs.

Declines in water levels were observed between 1979 and 1982. Water levels began to rise after this period until 1984, when once again water levels started declining, reaching and passing the 1979-1982 low point, establishing a historic low in 1992 to 1994. From 1987 to 1992, California experienced a multi-year drought causing groundwater levels in the District well fields to reach their lowest recorded levels during 1993 through 1995, until another dramatic decline occurred in 2005. Several factors have allowed for recovery from these declines since

2006, including a decrease in demand, the end of the recent drought, higher than average rainfall, and the operation of the Kern Water Bank which has recharged more than 0.5 MAF of water annually. WKWD recognizes the benefit of the banking operations and continues to support the efforts to reduce further declines.

FIGURE 3-1
HISTORICAL GROUNDWATER LEVELS



3.3.3 Well fields

WKWD's well fields are located in the Tupman area, about 15 miles northeast of Taft. The total peak production capacity of the eight active wells is 99 AF per day. Maximum daily usage averages approximately 61 AF. District wells have the current capability to pump a sufficient amount of water to meet peak daily demands as well as expected future growth. However, the ability of the wells to continue to pump water at present capacity is dependent on the health of the local aquifer.

The depths of the West Kern Water District wells range from 650 feet to 850 feet below ground surface (bgs). The pumping capacity per year and well depth is shown in Table 3-3. The current static water level is approximately 150 feet bgs. Pump depths are located at approximately 350 feet bgs and can be placed at lower levels if necessary. WKWD has installed six groundwater monitoring wells within the perimeter of its production well field. Groundwater sampling and water level monitoring provide data prior to WKWD pumping activity.

TABLE 3-3
GROUNDWATER WELLS

Well ID	Location	Well Depth	Capacity@ Avg. Depth (AF/YR)
2-01	WKWD Well Field	790	6,453
2-02	WKWD Well Field	850	8,388
6-01	WKWD Well Field	840	6,453
6-02	WKWD Well Field	840	6,453
6-03	WKWD Well Field	650	5,968
6-06	WKWD Well Field	780	8,065
7-01	WKWD Well Field	750	7,259
7-02	WKWD Well Field	820	6,613
		Total	55,652

Table 3-4 and 3-5 show the historical projected volumes to be pumped from the Kern River Alluvial Fan. Excess supply will be added to the water bank for future use.

TABLE 3-4
GROUNDWATER-VOLUME PUMPED (AFY)

Basin Name	Metered or Unmetered	2006	2007	2008	2009	2010
Kern River Alluvial Fan	Metered	22,457	22,612	21,788	21,740	21,804
Groundwater as a % of Total Water Supply		39%	53%	63%	56%	53%

TABLE 3-5
AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED (AFY)

Basin Name(s)	2015	2020	2025	2030	2035-opt
Kern River Alluvial Fan	26,983	27,080	27,177	27,275	27,373
% of Total Water Supply	0%	0%	7%	7%	7%

3.3.4 Banking program

The Kern County Water Agency (according to DWR Bulletin 118) estimates total groundwater in storage to be nearly 40,000,000 AF and dewatered storage to be 10,000,000 AF.

Water banking was initiated in 1978, and as of 2000 seven projects contained over 3,000,000 AF of banked water in a combined potential storage volume of 3,900,000 AF. Approximately 2/3 of the storage is in the Kern River Fan area west of Bakersfield. Water banking by West Kern Water District is located within the Kern River Fan area and began in 1966.

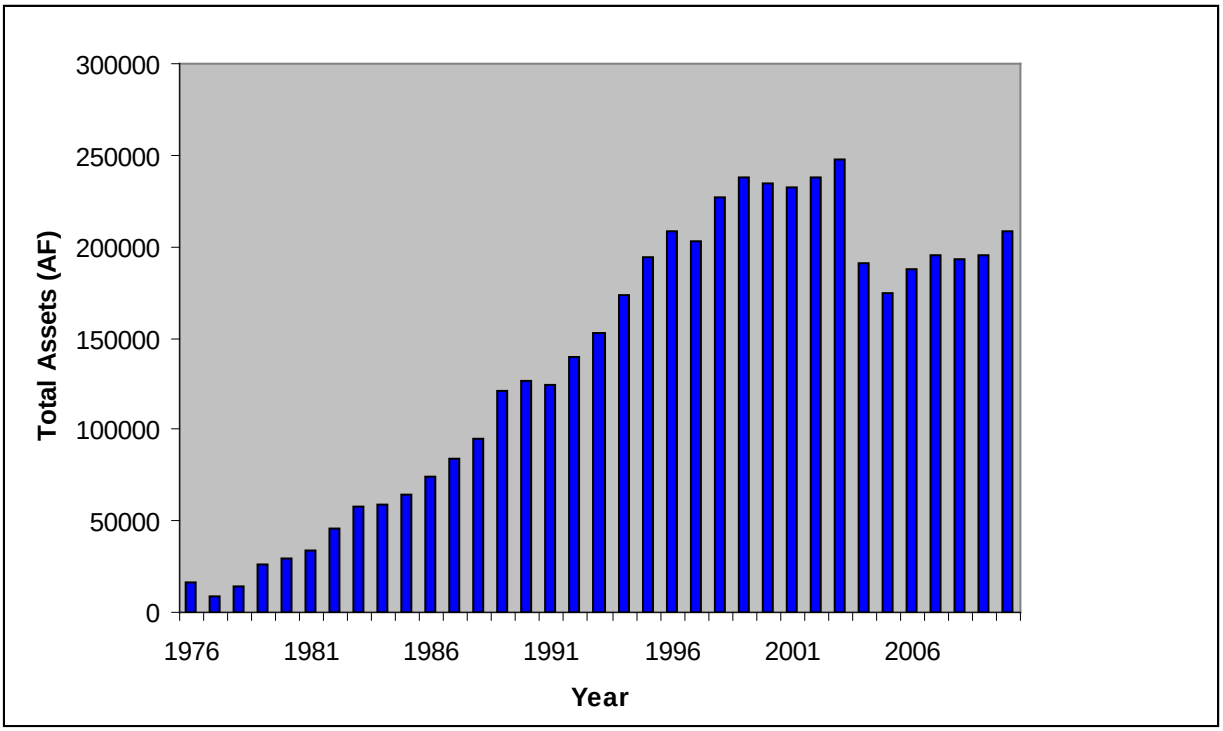
As part of the banking program WKWD has monitored and recorded groundwater levels in its production water wells on a regular basis for several decades. DWR and the KCWA contribute

additional water level data in the vicinity of the District's well field. The compilation of WKWD, KCWA and DWR data provides an understanding of the groundwater flow patterns and trends in water levels and show long-term trends of well water levels.

WKWD receives the majority of its SWP water by exchange with BVWSD as an in-lieu groundwater pumping/groundwater banking exchange program. BVWSD, part of which is located south of and northwest of the WKWD's well field, typically obtains water from the Kern River and from local groundwater pumping. In the exchange, BVWSD takes WKWD SWP water from the California Aqueduct for its needs instead of pumping local groundwater. WKWD, in turn, can then pump or bank a volume of water equivalent to that which Buena Vista Water Storage District (BVWSD) would otherwise have pumped.

In 1965, WKWD entered into an agreement with BVWSD to limit net groundwater withdrawals from the basin to 3,000 AFY, based on historic withdrawals prior to 1966 (Appendix C). WKWD is required to recharge the basin for amounts pumped in excess of 3,000 AFY. Average recharge has been approximately 17,418 AFY for the years 1977 - 2010. The 3,000 AFY is based on historical usage, and cannot be banked from year to year. Therefore, WKWD uses this water first in any given year. The total water currently banked, as of the end of the 2010 water year, is estimated at 176,674 AF. Assets for WKWD total 208,157 AF thus 31,483 additional AF is owed to WKWD from other agencies. Currently, WKWD has maintained a positive balance in the banking program and has approximately 8 years of supply currently banked.

FIGURE 3-2
HISTORICAL BANKING



3.3.5 Adopted Groundwater Management Plan

WKWD adopted a Groundwater Management Plan in February 1997 and is currently in the process of updating the plan (Appendix D). In areas of conjunctive use, groundwater recharge is a critical part of the overall Plan. Continuous review of banking practices is necessary enabling the District to gain the maximum benefit of its groundwater banking and water exchange efforts. With respect to the groundwater exchange and banking efforts with BVWSD, WKWD continues to pursue active recharge programs that result in positive water level and water quality results. In an effort to expand the local recharge program, evaluation of groundwater banking in areas surrounding the well field area by other entities and coordination with those entities is an on-going effort.

WKWD addressed the challenges within the basin data for hydraulic conductivity and storage capacity will be used to estimate the quantity of inflow and/or outflow of groundwater within the area of influence of WKWD's well field. The information will serve as an important water management tool in developing long-term planning decisions for the basins.

Aside from quantity issues, water quality monitoring will be used to augment the information obtained through the historical water level readings. The water quality samples will be taken in critical areas adjacent to known locations of contamination. With the compilation of the quality tests, and the groundwater level measurement, the District will improve its ability to effectively manage its groundwater supply.

There have been several Action Items identified for the Plan and those items will be implemented according to WKWD's Rules and Regulations as amended from time to time. To have a successful Plan, it is not necessary to implement all of the Action Items identified. Some items would be required only as a last resort due to the occurrence of emergency conditions within the District's Basin Plan Area.

3.3.5.1 Hydrogeologic Basin Assessment

A comprehensive investigation and assessment of WKWD's aquifer and basin area of influence needs to be performed to accomplish the following:

- Compilation of historical data
- Determine and quantify the hydraulic parameters and characteristics of the basin that govern groundwater flow (and contaminant transport)
- Evaluate the recharge and discharge components of the basin that affect the ability of the District to pump water

The large size of the basin and diversity of political boundaries precludes effective overall groundwater basin management. Identification of the Plan Area (the area of the basin that affects the WKWD's well field or is affected by WKWD, including the Kern Water Bank), should be delineated and understood.

3.3.5.2 Conjunctive Use Program

WKWD has historically practiced conjunctive water use, integrating surface and groundwater supplies, to meet current and future demand. Continuing this proactive approach will require an objective review of past and future procedures, including a review and assessment of:

- The effectiveness of past surface water recharge efforts.
- The effectiveness and impacts of recharge efforts conducted by neighboring groundwater users.
- The role WKWD will take in future conjunctive use programs.
- The continuing participation in banking and exchange programs currently in effect.
- The siting and construction of new or additional recharge facilities.
- WKWD efforts to maximize the amount and quality of surface water available for recharge purposes.
- Programs that stress water conservation efforts throughout WKWD.
- Existing and new domestic irrigation methods.
- Reuse of industrial water.
- Encouraging the use of domestic water saving devices.

WKWD's current, documented Water Conservation Plan will be evaluated on an annual basis and modified as needed.

3.3.5.3 Well field Evaluation

The physical soundness of WKWD production wells should be evaluated and documented, and an understanding developed of the structural integrity of each well and temporal changes in each well's production capability. WKWD maintains a regular rehabilitation maintenance program designed to effectively evaluate and enhance well performance.

The close proximity of the active wells in the well field has created a significant pumping depression that resulted in increased lifts, which results in increased pumping costs and other potential hydraulic problems. Pumping levels are below the top of the perforations, thus creating a condition for cascading water, which can increase well clogging and rapidly diminish the well's production capability. As part of the long-term planning and evaluation program, the siting of new production wells to mitigate mutual interference problems, while maintaining or increasing production, will be evaluated.

3.3.5.4 Monitoring Plan

WKWD's implementation of a monitoring plan evaluates both water levels and water quality, which are two dominant issues related to the reliability of the groundwater supply. Elements included in the monitoring plan are as follows:

- Continue monitoring water levels and sampling for water quality testing on a routine basis.

- Prepare maps depicting the information gathered through the monitoring phase.
- Develop reports quantifying the water demands, surface water, and groundwater supplies.
- Evaluate the need for expansion of the existing monitoring plan and monitoring network to adequately track groundwater gradient effects and potential wellfield contamination issues.

Summaries of these issues will assist WKWD in evaluating the effectiveness of the various elements of the program.

3.3.5.5 Groundwater Contamination Management

Groundwater contamination is one of WKWD's greatest concerns relating to protection of source water. Contamination originates from a number of sources or activities, such as leaking petroleum storage and distribution facilities or the application of fertilizers or pesticides. Monitoring and pursuit of effective remediation of contamination must be actively implemented. Although WKWD has met the requirements of the California Department of Public Health Service (CDPH), Drinking Water Source Assessment Program, the District will continue to assess the potential for source water contamination.

Effective control of contamination problems will require:

- Coordinated efforts between all regulatory agencies
- Source control
- A comprehensive understanding of the regional hydrogeology
- Identifying sources of contamination.

3.3.5.6 Wellhead and Aquifer Protection

The federal Wellhead Protection Program was established by Section 1428 of the Safe Drinking Water Act Amendments of 1986, to protect groundwater sources of public drinking water supplies from contamination, and eliminate the need for costly treatment to meet drinking water standards. The program is based on the concept of development and application of land-use controls, and other preventative measures to protect groundwater.

A Wellhead Protection Area (WHPA) is defined as, the surface and subsurface area surrounding a water well or well field supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field. The WHPA may also be the recharge area that provides the water to a well or well field.

Elements of the Wellhead Protection Program shall:

- Determine the roles of various state and local agencies.
- Prepare a summary of how the WHP goal will be achieved.
- Delineate Wellhead Protection Areas based on hydrogeologic information.
- Identify potential sources of contamination.

- Develop management approaches.
- Establish contingency plan.
- Develop new well drilling standards.
- Encourage public participation.

Because WKWD's well field is located within an active oilfield production area, the attendant problems associated with oilfield operations must be evaluated, as well as the effectiveness of implementing a meaningful Well Head Protection Program.

3.3.5.7 Well Construction, Abandonment Plan

Abandoned wells are a potential source of groundwater contamination and pose a serious physical hazard to humans and animals. Minimum standards for the destruction of wells are specified in Department of Water Resources Bulletins 74-81 and 74-90. The District will evaluate working through the Department of Water Resources and the County of Kern to upgrade standards for construction and abandonment of water wells.

3.3.5.8 Coordination with Land Use and Regulatory Agencies

The formation of a groundwater management district involves the development of relationships and communication strategies with various state and federal regulatory agencies. Groundwater planning, as defined in AB 3030, is a State-led activity. The State Water Resources Control Board, as the lead State water agency responsible for maintaining water quality standards, provides the framework and direction for California's groundwater protection efforts. National policy direction is provided by the Environmental Protection Agency, which gives national guidance in State-led efforts. Local agencies should consider working with these entities in actually designing and implementing their groundwater protection program.

3.3.6 Potential Supply Inconsistency

A single well with elevated arsenic levels potentially serves as the source of supply inconsistency for WKWD. To mitigate the impact of the elevated arsenic, WKWD implemented an arsenic blending plan in June 2009. The plan consists of utilizing water from wells which have an arsenic concentration history below the 10.0 ppm Maximum Contaminant Level (MCL) and blend with well with no or low arsenic concentration. WKWD maintains a telemetry system which allows for automated control of pumping, flow, tank levels and numerous other system operations. Production wells are manually prioritized in sequence, one through eight thus allowing for the dominance of low arsenic waters in the system. At no time will the high arsenic well serve the distribution system as a sole source. A monitoring plan has been established to ensure that proper blending has occurred to protect public health. A more extensive discussion can be found in Section 5 of this UWMP.

3.4 Transfers, Exchanges, and Groundwater Banking Programs

Additional water supplies can be purchased from other water agencies and sources; WKWD continues to seek out various opportunities. An important element to enhancing the long-term reliability and enhance the banking of water is the use of transfers, exchanges, and groundwater banking programs, such as those described below.

3.4.1 Transfers and Exchanges

WKWD will receive a total of 33,333 AF of water delivered to the West Kern Water District Project Vicinity over a 10 year period, which began in 2005. To date, WKWD has exercised this option to take delivery of this exchange. WKWD has additional 11,666 AF which will be received by 2015. At that time, the majority of water per short term agreements will have been delivered and an additional 23,166 AF will be received by 2020.

WKWD has the opportunity to transfer and exchange with various agencies in the area which has resulted in various short term agreements. Transfers with Tehachapi-Cummings Water District with a total of 2,000 AF will be delivered by 2015. Palmdale Water District will provide a single transfer prior to 2015 of 3,000 AF that represents a loan given to Palmdale Water District and owed to WKWD. WKWD also recognized the need for long term transfers and exchanges. A long term agreement beginning in 2015 with Buena Vista Water Storage District has been established to transfer 6,500 AFY during each 5 year planning period (Table 3-6).

TABLE 3-6
TRANSFER AND EXCHANGE OPPORTUNITIES

Source Transfer Agency	Transfer or Exchange	Short Term or Long Term	Proposed volume (AF)
Rosedale Rio Bravo WSD	1:3 Exchange	Short term	11,666
Tehachapi Cummings	Transfer	Short term	2,000
Palmdale Water District	Transfer	Short term	3,000
Buena Vista Water Storage District	Transfer	Long term	6,500
Total			**23,166**

3.5 Planned Water Supply Projects and Programs

Currently, no new supplies are available due to climate, location, and having a single basin for extraction. Although no new supplies will be on line, WKWD plans to increase its production capacity with the construction of new wells in the north well field which were previously inaccessible. The new wells will increase the capacity to up to 100,000 AF while current capacity is approximately 55,000 AF. Although current demand is well below the production capacity, this highly industrialized region will be able to sustain it's industrial and domestic demands more effectively with the new wells. WKWD has sufficient supply and banked water that exceeds the production capacity.

3.6 Development of Desalination

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). WKWD has evaluated such opportunities, and they are described in the following section, including opportunities for desalination of brackish water, groundwater, and seawater. However, at this time, none of these opportunities is practical or sources of brackish water available for WKWD, and WKWD has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan.

3.6.1 Opportunities for Brackish Water and/or Groundwater Desalination

As discussed in Chapter 5, the source of groundwater for WKWD is water recharges by SWP or the Kern River. Neither of these supplies contains high TDS levels and therefore do not contribute significant amounts of TDS which would cause brackish groundwater.

3.6.2 Opportunities for Seawater Desalination

Because the WKWD service area is not in a coastal area, it is neither practical nor economically feasible for WKWD to implement a seawater desalination program and WKWD has no current plans to pursue seawater desalination. Therefore, seawater desalinated supplies are not included in the supply summaries in this Plan.

Section 4: Recycled Water

This section of the Plan describes the existing and future recycled water opportunities available to the West Kern Water District service area. WKWD is a water supplier and does not oversee the sewage treatment facilities. However, WKWD cooperates with the City of Taft, which supports recycled water through long-term goals and inclusion within the City's General Plan as Policy PF-10. The City of Taft operates the northern wastewater treatment facility within Kern County and operates the correctional facility's wastewater treatment plant. The current plant capacity is 1.5 mgd and is evaluating an increase in capacity to 2.0 mgd with upgrades to tertiary treatment. With an increase in capacity and treatment technologies the annual effluent available for reuse will be approximately 2,200 AFY. The recycled water will be used to irrigate medians, parks, school playfields, agricultural lands, and golf courses and other participants have preliminarily been identified (Table 4-1). As no timeline has yet to be established for the upgrades, the projected volumes will remain consistent until a definitive time is established (Table 4-2). However, grant money is currently being sought to complete a reuse study. Financial incentives for recycled water use are in the preliminary stages and currently being studied.

Currently, secondary treated waste water is provided by the northern plant to a local agricultural field. The plant produces 1.3 mgd and utilizes all the effluent to irrigate 110 acres of crops year round with grain hay in the winter and alfalfa in the summer. The City provides the effluent to the agricultural producers and has a profit sharing agreement with the producer in exchange for the water.

TABLE 4-1
RECYCLED WATER- POTENTIAL FUTURE USES (AFY)

User Type	Description	Feasibility	2015	2020	2025	2030	2035-opt
Agricultural irrigation [(a)]	Fodder crops	Yes	1456	1456	1456	1456	1456
Landscape irrigation [(a)]	Parks/landscape	Preliminary evaluation	-	-	-	-	-
		Total	**1456**	**1456**	**1456**	**1456**	**1456**

Note:
(a) Currently no timeline is in place but studies and economic planning is currently being performed to generate an implementation timeline.

TABLE 4-2
RECYCLED WATER- WASTEWATER COLLECTED AND TREATMENT (AFY)

Type of Wastewater	2005	2010	2015	2020	2025	2030	2035-opt
Wastewater collected & treated in service area[(a)]	1456	1456	1456	1456	1456	1456	1456
Volume that meets recycled water standard	1456	1456	1456	1456	1456	1456	1456

Note:
(a) Treatment is currently at the secondary levels with plans to upgrade to tertiary treatment.

The City of Taft does not dispose of any water through discharging into any water body and future wastewater resulting from expansion projects will not be discharged but used on local agricultural fields (Table 4-3).

TABLE 4-3
RECYCLED WATER- NON-RECYCLED WASTEWATER DISPOSAL (AFY)

Method of disposal	Treatment Level	2010	2015	2020	2025	2030	2035-opt
Agriculture	Secondary	0	0	0	0	0	0
Total		0	0	0	0	0	0

In the 2005 UWMP, no recycled water was projected for 2010 (Table 4-4) however, as shown in the tables above all water from the wastewater treatment facility is used for the irrigation of crops. The region continues to work cooperatively to ensure that water is used effectively and with the expansion will continue to recycle and find opportunities for recycled water.

TABLE 4-4
2005 UWMP USE PROJECTION COMPARED TO 2010 ACTUAL (AFY)

User Type	2010 Actual Use-AFY	2005 Projection For 2010-AFY
Agricultural irrigation	1456	0
Landscape irrigation	0	0
Commercial irrigation	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse	0	0
Other	0	0
Total	**1456**	**0**

Section 5: Water Quality

5.1 Overview

The quality of any natural water is dynamic in nature. This is true for the local groundwater of the Kern River Alluvial Fan Basin. During periods of intense rainfall or snowmelt, routes of surface water movement are changed; new constituents are mobilized that are often dependent on local land use and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and snowmelt. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the California Department of Public Health (CDPH). West Kern Water District (WKWD) provides local groundwater, State Water Project water via Kern County Water Agency, exchanges with the Rosedale-Rio Bravo Water Storage District, and transfers of groundwater from the Kern Water Bank Authority for WKWD's potable supply. An annual Consumer Confidence Report (CCR) is provided to all residents receiving water from WKWD. That report includes detailed information about the results of quality testing of the water supplied during the preceding year (CCR, 2009).

The quality of water received by individual customers will vary depending on whether they receive SWP water, groundwater, or a blend. Some will receive only SWP water at all times, while others will receive only groundwater. Others may receive water from one well at one time, water from another well at a different time, different blends of well and SWP water at other times, and only SWP water at yet other times. These times may vary over the course of a day, a week, or a year.

This section provides a general description of the water quality of various water supplies. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

5.2 Imported Water Quality

The dominant supply is groundwater however the groundwater is recharged from imported surface supplies, most of which are imported from the State Water Project. This water from the SWP is not used directly as a potable supply. However, transfers and exchanges from the Rosedale-Rio Bravo Water Storage District and the Kern Water Bank Authority serve as additional sources. The WKWD also provides supplemental water to other local agencies via exchanges, with the condition of the water being returned at some determined point in time. The water quality of the water returned to WKWD will also be influenced, albeit minimally, by these supplies.

The water quality of the imported water and other recharge sources is not anticipated to reduce reliability. The constituents of concern within these sources are either treated prior to recharge

or the source is considered high quality water. The imported water and surface water sources used to recharge the Kern River Alluvial Fan Basin is not anticipated to significantly alter the water quality.

5.3 Groundwater Quality

Overall, groundwater quality within the District's groundwater basin is excellent. The water quality of the District's wells represent a family of water that is typical of water recharged by the Kern River. The water is typically a sodium bicarbonate water of low Total Dissolved Solids (TDS), although the upper portion of the aquifer contains a thin interval of calcium bicarbonate water, as indicated in several of DWR's multiple completion monitoring wells (Groundwater Management Plan, 1997). The water chemistry of the Kern River water tends to be a calcium sodium bicarbonate type. The calcium bicarbonate water recharged from the river apparently undergoes an ion exchange process as it infiltrates the deeper parts of the aquifer, changing it to a sodium bicarbonate type.

The local groundwater generally does not have microbial water quality problems. Parasites, bacteria, and viruses are filtered out as the water percolates through the soil, sand, and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped by wells to protect public health. Local groundwater has very little TOC and generally has very low concentrations of bromide which minimizes the potential for DPB formation. Taste and odor problems from algae are not an issue with groundwater. The recharge waters and the local Kern River are very low in TDS thus the groundwater is also low. Arsenic is the only constituent that presents any significant health risk and is found in one local well. The source of the arsenic is from natural local deposits within the region. In cooperation with the California Department of Public Health, WKWD developed and implemented an arsenic blending program on June 29, 2009 to ensure that the levels of arsenic in the system never exceed the State MCL of 10 ppb.

5.3.1 Groundwater Quality – Arsenic

While West Kern Water District’s drinking water meets the current standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic’s possible health effects against the cost of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low level arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. To reduce the levels of arsenic, WKWD executes an arsenic blending plan.

WKWD arsenic blending operations consist of utilizing wells which have an arsenic concentration history below the 10.0 ppm MCL and blend with well with no or low arsenic concentration wells. WKWD maintains a telemetry system which allows for automated control of pumping, flow, tank levels and numerous other system operations. Production wells are manually prioritized in sequence, one through eight thus allowing for the dominance of low arsenic waters in the system. At no time will the high arsenic well serving the distribution system as a sole source.

A monitoring plan has been established to ensure the proper blending has occurred to protect public health. WKWD at a minimum maintains records, daily, the flow and hours of operation of each well used for arsenic blending.

1. WKWD shall maintain daily, theoretical blending calculations for arsenic and submit a copy of the daily blending calculations for the month by the 10th day of the following month.
2. WKWD shall collect samples of the blended effluent for analysis of arsenic by an approved laboratory monthly. Results must be submitted by the laboratory to CDHS using the Electronic Data Transfer (EDT) method.
3. WKWD shall collect a blended sample and all wells utilized in arsenic blending, for analysis of arsenic by an approved laboratory, quarterly. Results shall be submitted by the laboratory to CDHS using the EDT method.
4. WKWD shall calibrate the flow meters on the wells' and the blended effluent discharge line at least annually.
5. CDHS must be notified if there is a failure in the blending operation.

5.4 Aquifer Protection

The District's boundaries encompass one of the world's largest petroleum producing areas. The contamination of District's groundwater, both actual and potential, by various entities engaged in petroleum production activities are part of an on-going assessment and evaluation by District staff and outside consultants. The District is working independently, and in cooperation with public agencies and oil companies, to address and correct any contamination threats to its groundwater. However, to date no significant threat to the groundwater has occurred as WKWD has met all state and federal MCLs and secondary MCLs.

5.5 Water Quality Impacts on Reliability

As introduced in Chapter 3, three factors affect the availability of groundwater: sufficient source capacity (wells and pumps); sustainability of the groundwater resource to meet pumping demand on a renewable basis; and protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two of those factors are addressed in Chapter 3. The third factor, the impact and resolution of contamination, is being addressed for the Kern River Alluvial Fan as follows. Table 5-1 shows there are no anticipated impacts on the reliability of the supply.

TABLE 5-1
WATER QUALITY-CURRENT AND PROJECTED WATER SUPPLY IMPACTS (AFY)

Water source	Description of condition	2010	2015	2020	2025	2030	2035-opt
Kern County Water Agency (SWP)[(a)]	Good	0	0	0	0	0	0
Groundwater							
Kern River Alluvial Fan (WKWD Bank Extraction)	Good	0	0	0	0	0	0
Transfers/Exchanges in							
Rosedale-Rio Bravo[(b)]	Good	0	0	0	-	-	-

Water source	Description of condition	2010	2015	2020	2025	2030	2035-opt
Tehachapi Cummings	Good	0	0	-	-	-	-
Palmdale Water District	Good	0	0	-	-	-	-
Buena Vista Water Storage District	Good	-	0	0	0	0	0

5.5.1 Groundwater Contamination (Arsenic) in Kern River Alluvial Fan

Due to one well in West Kern Water District's exceeding the Maximum Contaminant Level (MCL) of 10 ug/l, the Department of Public Health Service requires the District to implement an Arsenic Blending Plan established June 2009. The District blends water so arsenic concentrations are well below the 10 ug/l MCL since the implementation of this plan. In the event the arsenic blend exceeds the MCL, WKWD will shut down and isolate the high arsenic well from the distribution system. WKWD will contact DHS regarding the arsenic effluent exceeding the MCL. Once the well has been isolated from the distribution system, additional arsenic samples will be conducted on all wells and the effluent from the blending station. The plan ensures reliability in the system so as not to exceed the arsenic MCL.

Section 6: Reliability Planning

6.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water used with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for WKWD's service area.

It is the stated goal of WKWD to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

6.2 Reliability of Water Supplies

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of supplies to the Kern River Alluvial Fan and SWP. For example, from 2000 through 2002, southern California experienced dry conditions in all three years. WKWD was able to provide sufficient water due to agreements with local agencies and an active banking program. To ensure reliability, WKWD intends to increase their water reliability by pursuing increased access to the well fields and maximize the banking program. If one supplier reduces deliveries then additional supply can be acquired through the banked water in drier years.

As discussed in Section 3.3 of Chapter 3, WKWD's supply is pumped from the groundwater which is recharged using SWP waters. An assumption associated with the adjudication of the Basin was that all suppliers would be allowed to pump sufficient groundwater from the Basin.

The Kern County Water Agency (according to DWR Bulletin 118) estimates total groundwater in storage to be nearly 40,000,000 AF and dewatered storage to be 10,000,000 AF.

Water banking was initiated in 1978 and as of 2000, seven projects contained over 3,000,000 AF of banked water in a combined potential storage volume of 3,900,000 AF. Approximately 2/3 of the storage is in the Kern River Fan area west of Bakersfield. Water banking by West Kern Water District is located within the Kern River Fan area and began in 1966. Long-term groundwater sustainability is ensured by a positive balance maintained in the ground. WKWD is required to maintain a positive balance and amount of banked water exceeds the annual demands.

Storm water, imported water, and recycled water contribute to the recharge of the Basin. Storm water recharge is affected by changes in the local hydrology and is highly limited to the dry climate of the region. While the amount of SWP water allocated to contractors each year is dependent on a number of factors that can vary significantly from year to year. The primary factors affecting SWP supply availability include hydrologic conditions in northern California, the amount of water in SWP storage reservoirs at the beginning of the year, regulatory and operational constraints, and the total amount of water requested by the contractors. The availability of SWP supplies to SWP contractors is generally less than their full Table A amounts in many years and can be significantly less in very dry years. DWR's SWP Delivery Reliability

Report for 2009, issued in 2010, assists SWP contractors in assessing the reliability of the SWP component of their overall supplies. DWR provided these updated delivery reliability estimates to the SWP contractors for planning purposes. The most recent report states that the reliability of this water is subject to biological demands and climate change. The affects of SWP delivery does directly affect WKWD's supplies since their allotment is tied to the delivery amount KCWA receives annually. For the purposes of this plan, an assumption of 60 percent delivery is used as reported in DWR's 2009 State Water Project Delivery Reliability Report for the average year long-term delivery. Single dry year deliveries are estimated at 7 to 11 percent and multiple-dry year deliveries are estimated to be 34 to 36 percent.

The Kern River Alluvial Fan depends on local and imported supplies located in two distinct hydrologic regions of the state. As seen previously, a drought in Southern California may not necessarily mean a drought in Northern California exists. Reliability for WKWD will be tied to droughts in Northern California and SWP deliveries since the majority of the water is from the SWP. The predictable portfolio of WKWD ensures a reliable future water supply for the service area.

TABLE 6-1
FACTORS RESULTING IN INCONSISTENCY OF SUPPLY

Water Supply Sources	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
Kern County Water Agency (SWP)	x					Dependent on SWP deliveries
Groundwater						
Kern River Alluvial Fan (WKWD Bank Extraction)	x					Dependent on SWP deliveries
Transfers/Exchanges						
Rosedale-Rio Bravo		x				Time limit on agreement
Tehachapi Cummings		x				Time limit on agreement
Palmdale Water District	x					One time transfer to pay back a withdrawal
Buena Vista Water Storage District		x				Time limit on agreement but not during this planning period

6.3 Normal, Single-Dry and Multiple-Dry Year Planning

WKWD has a consistent water supply through the SWP and sufficient banked water to meet demands during normal, single-dry, and multiple-dry years. The following sections elaborate on the supplies available to WKWD.

6.4 Supply and Demand Comparisons

The available supplies and water demands for WKWD's service area were analyzed to access the region's ability to satisfy demands during three scenarios: a normal water year, single-dry year, and multiple-dry years. The tables in this section present the supplies and demands of the various drought scenarios for the projected planning period of 2010-2030 in five year increments. Table 6-2 presents the base years for the development of water year data. The base years were determined from the historical deliveries from the *State Water Project Delivery Reliability Report 2009.* Table 6-2 presents the supply reliability based on historical conditions which shows that the WKWD has historically maintained the supply levels reliable for the various water year types. The supplies were achieved through an active banking program that allowed WKWD to bank sufficient water to meet those demands. Tables 6-4, 6-5, and 6-6 at the end of this section summarize, respectively, Normal Water Year, Single-Dry Water Year, and Multiple-Dry Year supplies.

TABLE 6-2
BASIS OF WATER YEAR DATA

Water Year Type	Base Years	DWR Reliability Report
Average/Normal Water Year	1983	60%
Single-Dry Water Year	1977	7-11%
Multiple-Dry Water Years	1990-1992	34-36%

TABLE 6-3
SUPPLY RELIABILITY- HISTORICAL CONDITIONS (AFY)

			Multiple Dry Water Years			
Source	Normal Water Year	Single Dry Water Year	Year 1	Year 2	Year 3	Year 4
Kern County Water Agency (SWP)	18,900	2,205	2,205	8,820	8,820	8,820
Groundwater						
Kern River Alluvial Fan (WKWD Bank Extraction)	0	15,029	23,362	18,747	18,747	18,747
Transfers/Exchanges						
Rosedale-Rio Bravo	10,000	11666	3,333	3,333	3,333	3,333
Tehachapi Cummings	2,000	2,000	2,000	0	0	0
Buena Vista Water Storage District	6,500	6,500	6,500	6,500	6,500	6,500
% of Normal	100%	100%	100%	100%	100%	100%

6.4.1 Normal Water Year

Table 6-4 summarizes WKWD's water supplies available to meet demands over the 20-year planning period during an average/normal year. Supply was calculated based on the percent delivery from the SWP in which the long-term annual deliver is estimated at 60 percent. Demand totals are based on the projected demand in Table 2-1. Excess water beyond demand was a result from short-term agreements. This excess will be banked for future use.

TABLE 6-4
SUPPLY AND DEMAND COMPARISONS- NORMAL WATER YEAR (AFY)

	2010	2015	2020	2025	2030	2035-opt
Supply totals	36,029	42,066	37,066	27,177	27,275	27,373
Demand totals	27,170	26,983	27,080	27,177	27,275	27,373
Difference	8,859	15,083	9,986	0	0	0
Difference as % of supply	25%	36%	27%	0%	0%	0%
Difference as % of demand	33%	56%	37%	0%	0%	0%

6.4.2 Single-Dry Year

The water supplies and demands for WKWD's service area over the 20-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 6-5 summarizes the existing and planned supplies available to meet demands during a single-dry year. Demand during a single dry year an overall 10 percent increase in demand was assumed during a single dry year scenario.

TABLE 6-5
SUPPLY AND DEMAND COMPARISONS- SINGLE DRY YEAR (AFY)

	2010	2015	2020	2025	2030	2035-opt
Supply totals	36,029	42,066	37,066	29,895	30,003	30,110
Demand totals	27,170	29,681	29,788	29,895	30,003	30,111
Difference	8,859	12,385	7,278	0	0	0
Difference as % of supply	25%	29%	20%	0%	0%	0%
Difference as % of demand	33%	42%	24%	0%	0%	0%

6.4.3 Multiple-Dry Year

The water supplies and demands for WKWD's service area over the 20-year planning period were analyzed for a three-year multiple-dry year event, similar to the drought that occurred during the years 1990-1992. Table 6-6 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Demand during dry years was assumed to increase cumulatively 10 percent for over the dry period. As demand increased, the groundwater that is part of WKWD's banking program will be utilized to meet the demand.

TABLE 6-6
SUPPLY AND DEMAND COMPARISONS- MULTIPLE-DRY YEAR (AFY)

		2010	2015	2020	2025	2030	2035-opt
Multiple-dry year first year supply	Supply totals	36,029	42,066	37,066	27,992	28,093	28,194
	Demand totals	27,170	27,792	27,892	27,993	28,093	28,194
	Difference	8,859	14,274	9,174	0	0	0
	Difference as % of supply	25%	34%	25%	0%	0%	0%
	Difference as % of demand	33%	51%	33%	0%	0%	0%
Multiple-dry year second year supply	Supply totals	36,029	42,066	37,066	28,832	28,936	29,040
	Demand totals	27,170	28,626	28,729	28,832	28,936	29,040
	Difference	8,859	13,440	8,337	0	0	0
	Difference as % of supply	25%	32%	22%	0%	0%	0%
	Difference as % of demand	33%	47%	29%	0%	0%	0%
Multiple-dry year third year supply	Supply totals	36,029	42,066	37,066	29,697	29,804	29,911
	Demand totals	27,170	29,485	29,591	29,697	29,804	29,912
	Difference	8,859	12,581	7,475	0	0	0
	Difference as % of supply	25%	30%	20%	0%	0%	0%
	Difference as % of demand	33%	43%	25%	0%	0%	0%

6.4.4 Summary of Comparisons

As shown in the analyses above, WKWD has adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 20-year planning period. WKWD will pump groundwater to meet demand when demand exceeds the surface water supply in single dry and multiple dry year periods. In times of excess the water will be banked for use in the future. The excess in 2010 and 2015 were a result of water agreements recently secured and WKWD will continue to secure additional water for their banking program. Currently, WKWD has 176,674 AF in storage which represents 8 years of supply.

Section 7: Water Demand Management Measures

West Kern Water District recognizes that conserving water is an integral component of a responsible water strategy and is committed to providing education, tools, and incentives to help its customers reduce the amount of water they use.

7.1 Implementation of Demand Management Measures (DMMs)

The DMMS specified in the UWMP Act are the same as the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). Although the District is not a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU), the UWMP Act requires compliance with the DMMs.

The MOU and BMPs were revised by the CUWCC in 2008. The revised BMPs now contain a category of "Foundational BMPs" that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs, and water waste ordinances) and Public Education (public outreach and school education programs). The remaining "Programmatic" BMPs have been placed into three categories: Residential, Large Landscape, and Commercial, Industrial, Institutional Programs. These revisions are reflected in the DMM compliance requirements for the 2010 UWMP's (Section E).

The District is a retail water purveyor and subject to the regulatory requirements of the Urban Water Management Planning Act (Water Code sections 10630 *et seq*.), AB 1420 and SBX7-7, which apply to agencies supplying more than 3,000 connections or 3,000 AFY. In fiscal year 2010, the District had 7,454 retail connections and supplied 27,170 AF.

The following sections review compliance with the existing DMMs and provide an implementation plan for compliance with the UWMP Act.

7.2 Foundational DMMs

The new category of foundational DMMs is a significant shift in the revised MOU and the UWMP Act, and agencies are expected to implement them as a matter of their regular course of business. The foundational DMMs are in two categories: Utility Operations, which covers metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs, and water waste ordinances, and Public Education, which addresses public outreach and school education programs.

7.2.1 Utility Operations

7.2.1.1 Operations Practices

Conservation Coordinator (former DMM 12)

The District has three staff responsible for various conservation-related tasks. The Regulatory Administrator and the Assistant to Director of Operations work on conservation part-time and are in charge of program planning, development and administration.

There is also a position that is assigned to responding to customer issues such as high bills, leaks, and water waste. This position is currently being redefined and focused on conservation related tasks to better reflect the MOU requirements.

Water Waste Prevention (former DMM 13)

The District actively pursues incidents of water waste. District supervisors, Customer Service Representative, meter readers, and the flushing and sampling crew inspect customer usage routinely for anomalies. Incidents of waste are investigated and recommendations for correction are provided. Water sources are regulated and can be disconnected in cases of excessive leakage and/or facilities failure.

On December 19, 2000, the District adopted Ordinance 00-1 which prohibited water waste. This ordinance was replaced in January 2010 by the Water Shortage Response Plan (WSRP), Ordinance 10-1 (Appendix E). The WSRP establishes four levels of response actions to be implemented in times of shortage (Response Level 1 through Response Level 4), with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies. The policy establishes progressive response levels including regulations to be implemented during times of declared water shortages in order to attain escalating conservation goals.

The District does not have rule making authority. The District works with local City departments to support efficient water use and is currently working on adopting Cal Green water efficiency regulations into its water service or "will serve" requirements. The District will continue to work with the City to explore further opportunities for prevention of water waste.

7.2.2 Water Loss Control (former DMM 3)

The District has conducted pre-screening system audits of its distribution system and leak detection since 1990 as part of its regular operation and maintenance procedures. These audits are conducted each month and at the end of each year. The District's monthly metered units of ground water production and metered units of water deliveries are tracked and provided to the Department of Water Resources each year as part of our Public Water System Statistics Report. The District's goal has been to maintain a program of less than 7 percent annual water loss. Reports covering the past five years indicate the District's system has an annual water loss of less than 5 percent of total annual production. Current loss rate is estimated at about 1 to 1.5 percent.

Large transmission pipeline failures between pump stations are identified by the District's telemetry system. Smaller leaks are detected by a combination of District employees conducting pipeline monitoring, meter reading, routine maintenance, Underground Service Alerts and customers detecting and alerting staff of leaks.

In the past, this loss rate fell below the threshold that required action but that standard has been replaced by a new requirement that specifies implementation of the AWWA M36 Standard Water Audit methodology. Implementation of the M36 methodology requires a specific set of information on authorized and unauthorized consumptions, metering inaccuracies and more; most of this data are being collected through the District's current program.

The District implemented the AWWA M36 Standard Water Audit methodology for Calendar Year 2009, yielding an infrastructure leakage index of 0.55 and a score of 95 confidence. The District is well within the parameters of a high functioning system as defined by the AWWA.

7.2.3 Metering with commodity rates for all new connections and retrofit of existing connections (former DMM 4)

The District boundary encompasses 300 square miles with approximately 300 miles of transmission and distribution lines. All water deliveries provided through the District's system are metered and all new water service accounts require meters which are installed, maintained and read for billing purposes by the District.

All residential and commercial customers are billed by volume. Some institutional customers are billed by volume and some, accounting for about 40 percent of deliveries, have long-term "take or pay" contracts. (See retail conservation pricing section for more information)

The District monitors its system in a number of different ways. Large transmission pipeline failures between pump stations are identified by the District's telemetry system. Smaller leaks are detected by a combination of: pipeline monitoring, meter reading, routine maintenance and underground service alerts. The district also monitors customer bills and usage and flags any significant changes in use patterns, increases or decreases, for follow up. Follow up includes a technician visit and/or meter testing.

Most of the large landscapes in the District's service area have dedicated irrigation meters, including all landscaped medians and greenbelts, park accounts and a golf course (which has four meters and is classified as an Industrial account). Public school accounts have mixed use meters, but District staff is currently working with the local school district to explore the possibility of installing dedicated meters on school play fields.

7.2.4 Retail conservation pricing (former DMM 11)

The District has different pricing structures, depending on customer type:

1. Residential/Commercial Rate

   Residential and Commercial customers are classified as "Domestic" customers in the District's billing system and are billed at the same rate and on a bimonthly schedule. In 2009 the District started to migrate its Domestic customers from a declining block rate structure to a flat rate; the new structure will be fully implemented by 2012. The new structure is designed for compliance with the MOU requirement that 70 percent of revenue come from volumetric rates (Table 7-1).

TABLE 7-1
RESIDENTIAL AND COMMERCIAL VOLUMETRIC RATES (PER HCF)

Volume	2009	2010	2011
Up to 1,000 ft^3	$15.40	$16.48	$17.30
1,000 to 3,000 ft^3	$1.54	$1.65	$1.73
3,001 to 4,000 ft^3	$1.10	$1.18	$1.73
Over 4,001 ft^3	$1.10	$1.18	$1.24

2. Industrial Rate

Industrial water use accounts for almost 80 percent of the District's annual water demand; customers are subject to one of two rate structures:

a. Increasing block volumetric rates: About 20 percent of the District's industrial customers are subject to a block rate structure. Of these customers, about 95 percent fall into the highest rate tier. Between 2006 and 2010, 80 percent of the District's revenue from these industrial customers was generated from the top tier (Table 7-2).

TABLE 7-2
INDUSTRIAL REVENUES FROM VOLUMETRIC RATES

	2006	2007	2008	2009	2010
Tier 1	268,000	295,000	330,000	379,000	406,000
Tier 2	1,074,000	1,179,000	1,320,000	1,517,000	1,624,000
Total Revenue	1,342,000	1,474,000	1,650,000	1,896,000	2,030,000
Revenue from Tier 2	80%	80%	80%	80%	80%

b. Fixed Rate "Take or Pay" contracts: 80 percent of industrial customers have long term "Take or Pay" contracts which guarantee customers an agreed upon amount of water (Base Supply). Should the customer take less than the Base Supply, they must still pay one-half of the contract price for the water not taken. For any purchases beyond the Base Supply, the customer is required to pay for such water that is actually delivered and is billed volumetrically.

   For those customers holding "Take or Pay" contracts (which do not conform to the requirements of the DMM), the District is filing a legal exemption. The "Take or Pay" contracts are legally binding; some have expiration dates and some do not. Those that have expirations dates expire in various stages, the latest of which is in 2036. As these contracts begin to expire the District is shifting its customers to a negotiated volumetric rate structure with no "Take or Pay" clause and a standard volumetric rate structure that does conform to the requirements. The golf course, for example, is currently in the process of negotiating its rate once the contract expires. The new rates will be similar in structure to the existing volumetric rates for industrial customers.

   Most of these contracts were executed in 1988, long before the DMM requirements were developed, and are legally binding. The District does not have the legal authority to change the nature of these contracts prior to their expiration.

7.3 Education (formerly DMMs 7 and 8)

7.3.1 Public Information Programs (formerly DMM 7)

The District promotes water conservation efforts in coordination with AWWA, ACWA, and Water Association of Kern County programs. The District distributes public information through brochures, local speaking engagements, through its website (www.wkwd.org) and special events such as community and street fairs.

WKWD's education and outreach activities support conservation programs and enhance customer awareness of conservation. WKWD offers water conservation programs and services for all residential and commercial accounts. Programs and services include general and targeted promotions, presentations, workshops, free water savings devices, incentives for installing water-saving fixtures and equipment, as well as other education and outreach programs.

Free water use surveys are offered to WKWD residential and commercial customers, designed to help customers use water more efficiently, ranging from self-evaluations to on-site consultation of usage, targeting large residential and commercial landscape irrigators. Customers are also provided with educational materials and water-saving products to improve water use efficiency. Examples include free low-flow shower heads, shower timers and aerators for inside fixtures and for outside use, water shut-off nozzles for hose bibs.

WKWD also provides Indoor Conservation Kits to residential users upon request and at community outreach events. The kits provide customers information to help assess current practices and how to detect leaks.

A variety of educational publications/brochures that include conservation practices are utilized. Some brochures includes charts for quick references relative to indoor and outdoor conservation techniques, lists of appropriate plants for weather zones and landscape design tips.

WKWD also partners with a local horticulturist to assist in landscaping conservation techniques.

Marketing techniques used include a specific approach for individual customers and a broad approach to communities relative to the value of water and the importance of conservation, and include the following:

- Advertisements
- Public Service Announcements
- Bill Inserts
- Door Hangers
- District Office Displays
- Newspaper and Magazine Ads
- Community Billboards
- Newsletters/Brochures/Magazines distributed around communities at other business offices
- Cable Television
- Radio
- Demonstration gardens
- Special Events – Media
- Programs coordinated with other agencies and public interest groups

- Educational/informational sessions for commercial, industrial and landscape irrigation customers (two public forums.)

The budget for these conservation-related Public Information programs has been increasing over the years. Starting at just under $9,000 in 2000, expenditures reached about $22,000 in 2010.

7.3.2 School Education Programs (formerly DMM 8)

WKWD recognizes the importance of educational benefits and works with the Kern County Water Agency to provide local students and teachers a variety of education programs and tools. The programs are free and include assemblies, classroom presentations, Project WET facilitation, water conservation programs and contests to K through 6th grade levels (Table 7-3). Water science is addressed for 7th through 12th grade along with video lessons, poster contests, and scholarship programs. During Water Awareness Week, the District conducts water conservation activities in each school with winners in each class receiving water related prizes.

TABLE 7-3
SCHOOL EDUCATION ACTIVITIES

Year	Activity (grade)		Number of Students Reached (classes)	
2006	1 assembly	(K-3)	440 students	(13-15 classes)
2007	1 assembly	(K-3)	460 students	(13-15 classes)
	1 assembly	(4-6)	40 students	(3 classes)
2008	1 assembly	(1-6)	80 students	(6 classes)
2009	1 assembly		20 students	(6 classes)
	Poster Contest	(1-6)		
2010	1 assembly		80 students	(6 classes)
	Project WET , 2 Teacher training sessions		40 Teachers	

7.4 Programmatic DMMs

WKWD has chosen the DMM implementation approach for complying with the MOU; DMM status is described in the following sections.

All DMMs with the exception of the residential assistance program and the residential landscape water audit are cost effective and an implementation program has been developed for compliance. The cost effectiveness analysis is compared with WKWD water cost of $725/AF. Where possible, the District provides an estimate of expected conservation savings but has not developed an estimate for the effect of the savings on its ability to further reduce demand. Given that many of these are new programs, demand hardening is not a concern at this time.

7.4.1 Residential DMMs

1) Residential Assistance Program and

2) Landscape Water Surveys (former DMMs 1 and 2)

The District is combining the Residential Assistance and Landscape Water Survey programs into a single analysis because the program is implemented as a single audit program with indoor and landscape elements. Also, the estimates of costs and savings provided by DWR combine the indoor and landscape elements.

The District currently has one full time employee who is assigned to respond to customer issues such as high bills, leaks and water waste. The position is currently focused on meter testing and utility-side meter issues as well as high bill complaints, posting door hangers and providing information in water waste situations. The inspector also provides low-flow devices to customers as appropriate.

The District is filing for a cost-effectiveness exemption to the survey programs (Table 7-4). At $829/AF, the program costs exceed the District's water cost of $725/AF. The analysis was performed using CUWCC assumptions for water savings, decay and program costs (Table 7-5) and is based on performing 106 surveys per year or 1.5 percent of residential accounts.

TABLE 7-4
COST EFFECTIVENESS SUMMARY:
RESIDENTIAL ASSISTANCE PROGRAM

Total Costs	$366,853
Total Benefits	$235,024
Discount Rate	2.9%
Time Horizon	25 years
Cost of Water	$829
Water Savings (AFY)	442

TABLE 7-5
ASSUMPTIONS FOR RESIDENTIAL ASSISTANCE PROGRAM

Savings	Decay	Admin cost	Source
0.045 AFY/audit	10% (report recommends 25% this program assumed high users would be targeted, resulting in a lower decay rate)	25 % Cost includes customer contact, inspection scheduling, marketing materials and follow up	CUWCC estimates from Research and Evaluation Committee Report (R&E) 8/13/09)

7.4.2 High-Efficiency Clothes Washers (former DMM 6)

The District is not currently offering High-Efficiency Clothes Washers (HECW) rebates but will begin doing so in 2012. To be in compliance the District needs to provide approximately 70 rebates per year, for a total savings of 90 AF by 2020. The District is planning on providing customers with a rebate of up to $150/washer; the estimated cost of this program is $14,000 per year. The cumulative savings would be about 97 AF or about 2.0 gpcd by 2020.

Due to the impacts of the economic downturn on the District's customers, the District is not confident that a cost-effective rebate could provide enough incentive for customers to replace

their machines at this time. The District will therefore be closely monitoring program participation and assessing other Flex Track options for meeting the requirements of the DMM.

The District will also look for local program partners such as Pacific Gas and Electric (PG&E) and/or the wastewater utility to combine marketing, outreach and administrative costs, and potentially increase incentive amounts. Customers will be notified about the program through bill inserts, online, as well as some of the other marketing strategies discussed in Section 2.1. Program participation will be tracked through the billing system; water savings will either be estimated based on standard assumptions or through the billing system if the capacity can be developed.

7.4.3 WaterSense Specification (WSS) Toilets (former DMM 14)

The District is not currently offering High Efficiency Toilet (HET) rebates but will begin doing so in 2012. Based on a resale rate for the City of Taft of 4 percent[1], the program goal is a replacement of 260 units per year over 10 years. The District is planning on providing customers with a rebate of up to $100 per toilet; the estimated cost of this program is $39,000 per year. The cumulative savings would be about 338 AF or about 3.2 gpcd by 2020.

Customers will be notified about the program through bill inserts, online, as well as some of the other marketing vehicles discussed in Section 2.1. Program participation will be tracked through the billing system; water savings will either be estimated based on standard assumptions or through the billing system if the capacity can be developed.

7.4.4 Water Sense Specification for New Residential Development

There is very little new development in the District's service area; it estimated to be on the order of about 0.5 percent. See Chapter 2 for discussion of service area characteristics.

The requirements of the DMM is that the District provide incentives such as rebates, recognition programs, or reduced connection fees, or ordinances requiring residential construction meeting water sense specifications (WSS) for single and multi-family housing until a local, state or federal regulation is passed requiring water efficient fixtures. The 2010 California Green Building Standards Code (CAL Green Code, CALGreenCode.pdf) addresses these WSS requirements.

The CAL Green Code sets mandatory green building measures, including a 20 percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. The Code also identifies voluntary measures that set a higher standard of efficiency. The District, in collaboration with the local planning departments is reviewing the proposed standards to determine the most appropriate direction. The District is also supporting implementation and monitoring of the Code by incorporating the new rules into its water service or "will serve" requirements.

7.4.5 Commercial, Industrial, and Institutional DMMs (Former BMP 8)

Eighty-two percent of water deliveries in the District go to industrial customers; commercial accounts are included in "domestic" or residential uses. Based on 2009 deliveries of 21,234 AF, the industrial sector must reduce consumption 2,123 AF by 2020, or about 212 AFY.

[1] City of Taft, Assessor's Office. Conversation 10/22/10.

The primary industries represented by these industrial accounts are oil production and electrical co-generation at 46 and 54 percent respectively.

- **Oil Industry**
  Oil producing operations have provided the majority of the District's water sales for more than forty years. Oil production in western Kern County relies heavily on the injection of steam into the oil bearing formations to enhance the recovery of oil. Steam injection is required due to the oil's low gravity, which reduces its ability to flow or to be pumped to the surface. Once the steam is injected into the formation the steam condenses and forms an oil/water emulsion, which can be pumped or lifted back to the earth's surface. After the oil/water emulsion is recovered the oil and water must be separated to a maximum of 3 percent residual water and sediment in the oil. The oil leaves the facility via pipelines to be further refined and the water remains on site and is recycled back to steam. The water recycling process has a water loss from water staying with the oil (at a rate of about 3 percent) and because not all of the steam is recovered from the geologic formation.

- **Electrical Co-Generation**
  The electrical co-generation industry utilizes steam or natural gas, which power turbines to generate electricity. Both systems require a large amount of water to generate steam or water for cooling tower operations. Where steam is used to turn the turbine, the steam will pass through the turbines up to seven times before the steam degrades to a quality which it can no longer be used. Once the steam becomes unsuitable, it is necessary to purchase additional water to produce new steam. When the process permits, the steam can turn the electrical turbine and then be utilized for steam injection for the oil-producing industry. This process is limited to the co-located geographic sites of the electrical co-generation facility and the oil-producing facility.

- **Golf Courses**
  Golf courses are also classified as "industrial" use. There is one major golf course in the service area that uses about 870 AFY. Currently a pilot program installing artificial turf on one of the golf courses is being discussed as well as a pilot installing subsurface irrigation. Since 2009, the District has been working with Golf course staff to explore the various efficiency options.

To achieve the ten percent savings, the District will outreach directly to its largest customers. Most of these customers are relatively large and already have a relationship with the District. Both the oil and electrical co-generation industries employ technical personnel with a high level of expertise who are dedicated to exploring methods to enhance production and reduce operational costs. The District is somewhat limited in the added value it can provide in terms of providing technical assistance to these industries for reducing their water consumption, however it is actively exploring new opportunities. Recent discussions have addressed using "produced water" to offset potable supplies.

Produced water is a term used in the oil industry to describe water that is produced along with the oil and gas. Oil reservoirs have a natural water layer (formation water) that lies under the hydrocarbons and frequently contains large volumes of water. To achieve maximum oil recovery additional water is often injected into the reservoirs to help force the oil to the surface. Both the formation water and the injected water are eventually produced along with the oil and therefore as the field becomes depleted the produced water content of the oil increases.

Historically, produced water was disposed of in large evaporation ponds, however there is increasing focus on beneficial re-uses for produced water. Some options that have been discussed are using produced water for landscape and/or dust control. Produced water is considered an industrial waste and therefore there are numerous water quality related issues to consider. Understanding customer water quality needs and outputs could help the District evaluate whether alternative supplies would be feasible and/or whether customer produced water can be utilized to offset potable supplies elsewhere in the service area or in other parts of Kern County. The District will continue to explore measures directly related to the process, resource and water quality needs of its largest customers in the power and oil industries.

Finally, the District will continue its work with the golf course in exploring alternatives for improving efficiency. A potential irrigation efficiency pilot is scheduled for 2012.

Program participation is tracked through direct reports with the customers. Consumption patterns and water savings will be tracked through the billing system.

7.4.6 Landscape DMM (Former BMP 5)

About one-third of Domestic use goes to irrigation. In 2009 the District used about 1,420 AF to irrigate its parks, schools and other irrigation accounts and 870 AF to irrigate the golf course. The District has dedicated meters on all of its parks accounts and four for the golf course while the 11 schools are on mixed use meters. In addition, medians in the City of Taft are all on dedicated meters. Consumption information is available for all of these users.

The DMM requires that the District develop water budgets for 44 of the 49 accounts over the course of ten years. The District will start to develop ETo based water budgets for its irrigation accounts at a rate of four per year starting in 2012. The District will include the budget information with the customer's bills and provide technical support as required.

The District has been having conversations with the City of Taft School District about installing dedicated meters for the large fields. This metering project is estimated to cost about $18,000 and started with the high school in January 2011. City of Maricopa High School has also expressed a willingness to work with the District to split its meters; that project is scheduled for 2012. Both these projects will allow the District and the schools to gather the information required to understand the landscape uses and then do a proper assessment of potential efficiency improvements and identify the best ways to save water.

The Jr. College, High School, Grammar Schools, and Park District each employ individuals trained in landscape water efficiency. The District will work with staff to explore further opportunities to promote efficient water use at the schools as well.

Note that parks are classified as residential while golf courses are included in industrial uses. Use in golf courses, therefore, is addressed in the CII section.

Reducing large landscape uses is a high priority for the District. The District is already in direct contact with most of its landscape customers. The District will continue to work with these customers, identify efficiency opportunities and support implementation through upgrades, rebates, metering or in other ways that are determined to be most effective. Consumption patterns will be more closely tracked and communicated with the customer, and water savings will be measured through the billing system.

7.5 SBX7-7 Compliance

The District's 2020 SBx7-7 compliance goal is 170 gpcd (Section 3).

The District recognizes the need to expand conservation programs and efforts in order to meet both its SBx7-7 and DMM requirements. As discussed in Section 3 the SBx7-7 requirements are applicable only to domestic uses and, unlike the DMM requirements, do not apply to process water. SBX7-7 considers process water use and requires and anticipates significant new regulations for large industrial water users in the future (with guidance to be provided by early 2012).

The District is in the process of identifying programs and preparing implementation plans. In addition to the activities identified for DMM implementation, the District is considering implementation of the following programs:

1. Pricing: By 2012 the District will have replaced its declining block rate structure. This is expected to have significant impact of Domestic use, especially in the higher tiers.

2. Rebates: The District will begin to offer rebates for both its residential and commercial customers. Rebates will include residential HETs (starting in 2012), residential HECWs (2012) and zero and low-flow urinal rebates and CII specific HETs (2013).

3. Landscape: The District will work with the School District to install dedicated irrigation meters and identify appropriate efficiency options. The District will also work with the Parks to identify opportunities to improve their irrigation efficiency. The District will provide the School District and Parks with financial and technical support as needed.

4. The District will work with the golf course to identify and implement water saving opportunities including artificial turf and automatic controllers.

In addition to these programs, the District plans to develop its water use tracking to monitor customer use, program participation, changes in use and impacts of the new programs on consumption. The District will then have the capacity to adjust programs based on how well they are meeting projected goals.

Section 8: Water Shortage Contingency Planning

8.1 Overview

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought which limits supplies, an earthquake which damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. This chapter of the Plan describes how West Kern Water District plans to respond to such emergencies so that emergency needs are met promptly and equitably.

Groundwater pumped from the Kern River Alluvial Fan is vulnerable to fluctuation in SWP water deliveries for recharge. SWP water deliveries vary based on the hydrologic conditions of that year. WKWD has the responsibility for ensuring its water balance never goes below zero. Thus WKWD maintains records that show the District has a positive water balance within the basin. The Basin stores 40,000,000 AF with WKWD having banked 176,627 AF.

8.2 Coordinated Planning

8.2.1 Stages of Action to Respond to Water Shortages

The District has developed a four stage-rationing plan (see Table 8-1) to invoke during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage. Table 8-1 presents the four-stage rationing and demand reduction goals for the District.

TABLE 8-1
RATIONING AND REDUCTION GOALS

Deficiency	Stage	Demand Reduction Goal	Type of Program
Up to 15%	I	Up to 15% reduction	Voluntary
15 - 25%	II	15-25% reduction	Mandatory
25 - 35%	III	25-35% reduction	Mandatory
35 - >50%	IV	35-50% reduction	Mandatory

A Water Shortage Response Plan was finalized in May 2011 (Appendix F). The plan includes four levels of response to lessen or avoid supply shortages as shown in Table 8-1. Ordinance No. 10-1 (in the matter of rescinding Ordinance 00-1 and implementing a water shortage contingency plan) was adopted by the Board of Directors on 26 January 2010. Response Level 1 includes public conservation education programs and requests voluntary reduction for domestic customers. Response Level 2 includes all elements of Response Level 1 and requires the following: additional public conservation education programs, voluntary conservation and mandatory rationing of domestic water; reduction of large landscape water demand by 25 percent; eliminate industrial customers demand above contracted amount; reduce by 35 percent non-contracted industrial customers water demand. Response Level 3 includes all elements of Response Levels 1 and 2, and requires the following: additional public conservation education programs, voluntary conservation and mandatory rationing of domestic water; reduction of large landscape water demand by 25 percent; eliminate industrial customers demand above

contracted amount; reduce by 77 percent non-contracted industrial customers water demand. Response Level 4 includes all elements of Response Levels 1 to 3, and requires the following: additional public conservation education programs, voluntary conservation and mandatory rationing of domestic water, reduction of large landscape water demand by 35 percent; eliminate industrial customers demand above contracted amount; eliminate non-contracted industrial customers water demand, reduce by 10 percent contracted industrial customers water demand, excluding large landscape watering; and reduce selected large customers by 10 percent (Table 8-2).

TABLE 8-2
RESPONSE LEVEL AND REDUCTION GOALS

Response Level	Type of Program
1	Voluntary
2	Voluntary conservation
	Mandatory domestic reduction
	Large landscape 25% reduction
	Contracted industrial- not to exceed contract
	Non-contract industrial 35% reduction
3	Non-contract industrial 77% reduction
4	Large landscape 35% reduction
	Contracted industrial 10% reduction
	Eliminate non-contract industrial demand
	Large customer demand 10% reduction

Priorities for use of available water, based on Chapter 3 of the California Water Code, are:

- Health and Safety—Interior residential, sanitation and fire protection
- Commercial, Industrial, and Governmental—Maintain jobs and economic base
- Existing Landscaping—Especially trees and shrubs
- New Demand—Projects with permits when shortage declared

Based on the California Water Code, priorities specific to the District's service area for use of available potable water during shortages were based on input from the District Emergency Response Team, citizen groups, and legal requirements set forth in the California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking system:

- Minimum health and safety allocations for interior residential needs (includes single family, multi-family, hospitals and convalescent facilities, retirement and mobile home communities, and student housing, and fire fighting and public safety)
- Commercial, industrial, institutional/governmental operations (where water is used for manufacturing and for minimum health and safety allocations for employees and visitors), to maintain jobs and economic base of the community (not for landscape uses)
- Permanent agriculture (orchards, vineyards, and other commercial agriculture which would require at least five years to return to production)

- Annual agriculture (floriculture, strawberries, other truck crops)
- Existing landscaping
- New customers, proposed projects without permits when shortage declared

Water quantity calculations used to determine the interior household gpcd requirements for health and safety are provided in Table 8-3. As developed in Table 8-3, the California Water Code Stage 2, 3, and 4 health and safety allotments are 68 gpcd, or 33 ccf (100 cubic feet) per person per year. When considering this allotment and the 2009 population of 17,961, the total annual water supply required to meet the first priority use during a water shortage is approximately 1,368 AFY based on an 68 gcpd.

TABLE 8-3
PER CAPITA HEALTH AND SAFETY WATER QUANTITY CALCULATIONS

	Non-Conserving Fixtures		Habit Changes		Conserving Fixtures	
Toilets	6 flushes x 5.5 gpf =	33.0	4 flushes x 5.5 gpf =	22.0	5 flushes x 1.6 gpf =	8.0
Showers	6 min x 4.0 gpm =	24.0	4.5 min x 4.0 gpm =	18.0	5 min x 2.0 gpm =	10.0
Washers	12.5 gpcd (1/3 load) =	12.5	11.0 gpcd =	11.0	11.5 gpcd (1/3 load) =	11.5
Kitchens	4.5 gpcd =	4.5	4 gpcd =	4.0	4 gpcd =	4.0
Other	6 gpcd =	6.0	4 gpcd =	4.0	4 gpcd =	4.0
Total gpcd		80.0		60.0		37.5
CCF per capita per year		39.0		29.0		18.0

8.3 Minimum Water Supply Available During Next Three Years

The minimum water supply available during the next three years would occur during a three-year multiple-dry year event between the years 2011 and 2013. As shown in Table 8-4, the total supplies are approximately 32,238 AFY during the next three years but may vary due to SWP deliveries for that year. When comparing these supplies to the demand projections provided in Chapters 2 and 6 of this Plan, WKWD has adequate supplies available to meet projected demands should a multiple-dry year period occur during the next three years.

TABLE 8-4
THREE-YEAR ESTIMATED MINIMUM WATER SUPPLY (AFY)

Water Supply Sources **Water Purchased From:**	**2011**	**2012**	**2013**
Kern County Water Agency (SWP)	28350	28350	28350
Groundwater			
Kern River Alluvial Fan (WKWD Bank Extraction)	0	0	0
Exchanges in			
Rosedale-Rio Bravo	3,888	3,888	3,888
Total	**32,238**	**32,238**	**32,238**

8.4 Actions to Prepare For Catastrophic Interruption

In the event WKWD encounters a catastrophic interruption of water, WKWD's Emergency Action Plan will be activated by management. The plan is structured to provide water for domestic and emergency use by reducing and/or eliminating industrial water usage. WKWD's water storage capacity of 18 million gallons is maintained in twenty five (25) above ground storage tanks. Staff estimates fifty percent of the water storage will be maintained during a catastrophic event. The Emergency Action Plan is divided into thirteen grids of responsibility within WKWD's 3000 square mile service area. Specific water-critical customers have been identified. WKWD also has the capability of disinfecting water at all of its major pumping stations. WKWD has the option of utilizing natural gas/propane engines for pumping water if electrical power is interrupted.

The California Division of Mines and Geology has stated two of the aqueduct systems that import water to southern California (including the California Aqueduct) could be ruptured by displacement on the San Andreas Fault, and supply may not be restored for a three to six week period. The situation would be further complicated by physical damage to pumping equipment and local loss of electrical power.

DWR has a contingency aqueduct outage plan for restoring the California Aqueduct to service should a major break occur, which it estimates would take approximately four months to repair.

Extended supply shortages of both groundwater and imported water, due to power outages and/or equipment damage, would be severe until the water supply could be restored.

8.4.1 SWP Emergency Outage Scenarios

In addition to earthquakes, the SWP could experience other emergency outage scenarios. Past examples include slippage of aqueduct side panels into the California Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Banos), and various subsidence repairs needed along the East Branch of the Aqueduct since the 1980s. All these outages were short-term in nature (on the order of weeks) and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation while repairs were made. Thus, the SWP contractors experienced no interruption in deliveries.

One of the SWP's important design engineering features is the ability to isolate parts of the system. The Aqueduct is divided into "pools." Thus, if one reservoir or portion of the California Aqueduct is damaged in some way, other portions of the system can still remain in operation. The Primary SWP facilities are shown on Figure 8-1.

FIGURE 8-1
PRIMARY SWP FACILITIES

Source: DWR Bulletin 132-05

Other events could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Delta near the Harvey O. Banks Pumping Plant, a flood or earthquake event that severely damaged the Aqueduct along its San Joaquin Valley traverse, or an earthquake event along either the West or East Branches. Such events could impact some or all SWP contractors south of the Delta.

The response of DWR, KCWA, and other SWP contractors to such events would be highly dependent on the type and location of any such event. In typical SWP operations, water flowing through the Delta is diverted at the SWP's main pumping facility, located in the southern Delta, and is pumped into the California Aqueduct. During the relatively heavier runoff period in the winter and early spring, Delta diversions generally exceed SWP contractor demands, and the excess is stored in San Luis Reservoir. Storage in SWP aqueduct terminal reservoirs, such as Pyramid and Castaic Lakes, is also refilled during this period. During the summer and fall, when diversions from the Delta are generally more limited and less than contractor demands, releases from San Luis Reservoir are used to make up the difference in deliveries to contractors. The SWP share of maximum storage capacity at San Luis Reservoir is 1,062,000 AF.

KCWA (and WKWD) receives its SWP deliveries through the main stem of the California Aqueduct at Tupman.

In addition to SWP storage south of the Delta in San Luis and the terminal reservoirs, a number of contractors have stored water in groundwater banking programs in the San Joaquin Valley, and many also have surface and groundwater storage within their own service areas.

Two scenarios that could impact the delivery to KCWA of its SWP supply, previously banked supplies, or other supplies delivered to it through the California Aqueduct are described below. For each of these scenarios, it was assumed that an outage of six months could occur. KCWA's ability to meet demands during the worst of these scenarios is presented following the scenario descriptions.

Scenario 1: Levee Breach Near Banks Pumping Plant

As demonstrated by the June 2004 Jones Tract levee breach and previous levee breaks, the Delta's levee system is fragile. The SWP's main pumping facility, Banks Pumping Plant, is located in the southern Delta. Should a major levee in the Delta near these facilities fail catastrophically, salt water from the eastern portions of San Francisco Bay would flow into the Delta, displacing the fresh water runoff that supplies the SWP. All pumping from the Delta would be disrupted until water quality conditions stabilized and returned to pre-breach conditions. The re-freshening of Delta water quality would require large amounts of additional Delta inflows, which might not be immediately available, depending on the timing of the levee breach. The Jones Tract repairs took several weeks to accomplish and months to complete; a more severe breach could take much longer, during which time pumping from the Delta might not be available on a regular basis.

Assuming that the Banks Pumping Plant would be out of service for six months, DWR could continue making at least some SWP deliveries to all southern California contractors from water stored in San Luis Reservoir. The water available for such deliveries would be dependent on the storage in San Luis Reservoir at the time the outage occurred and could be minimal if it occurred in the late summer or early fall when San Luis Reservoir storage is typically low. KCWA water stored in groundwater banking programs in the San Joaquin Valley may also be available for withdrawal and delivery to WKWD.

Scenario 2: Complete Disruption of the California Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the California Aqueduct (the portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the aqueduct, deliveries from San Luis Reservoir could be interrupted for a period of time. DWR has informed the SWP contractors that a four-month outage could be expected in such an event. KCWA's assumption is a six-month outage.

Arroyo Pasajero is located downstream of San Luis Reservoir and upstream of the primary groundwater banking programs in the San Joaquin Valley. Assuming an outage at a location near Arroyo Pasajero that resulted in the California Aqueduct being out of service for six months, supplies from San Luis Reservoir would not be available to those SWP contractors located downstream of that point. However, KCWA water stored in groundwater banking programs in the San Joaquin Valley could be withdrawn and delivered to WKWD. Assuming an outage at a location on the California Aqueduct south of the groundwater banking programs in the San Joaquin Valley, these supplies would still be available to KCWA.

Scenario 3: Complete Disruption of the Cross Valley Canal at Tupman Turnout on the California Aqueduct

If a major earthquake (an event similar to or greater than the 1994 Northridge earthquake) were to damage this portion of the Aqueduct, deliveries could be interrupted. The exact location of such damage along the Aqueduct would be key to determining emergency operations by DWR and KCWA. For this scenario, it was assumed that the Aqueduct and the Cross Valley Canal (CVC) turnout at Tupman would suffer a single-location break and deliveries of SWP water from north of the Tupman Turnout or of KCWA water stored in groundwater banking programs in the San Joaquin Valley would not be available. In this scenario, WKWD has sufficient banked water in their own well fields for several years of supply.

In any of these three SWP emergency outage scenarios, DWR and the SWP contractors would coordinate operations to minimize supply disruptions. Depending on the particular outage scenario or outage location, some or all of the SWP contractors south of the Delta might be affected. But even among those contractors, potential impacts would differ given each contractor's specific mix of other supplies and available storage. During past SWP outages, the SWP contractors have worked cooperatively to minimize supply impacts among all contractors. Past examples of such cooperation have included certain SWP contractors agreeing to rely more heavily on alternate supplies, allowing more of the outage-limited SWP supply to be delivered to other contractors; and exchanges among SWP contractors, allowing delivery of one contractor's SWP or other water to another contractor, with that water being returned after the outage was over.

Of these three SWP outage scenarios, the Tupman outage scenario presents the worst-case scenario for KCWA. In this scenario, WKWD would rely on local supplies and water available from the Kern River, which comes from Lake Isabella.

It is assumed that local well production would be unimpaired by the outage and that the outage would occur during a year when average/normal supplies would be available. It is assumed that adequate well and aquifer capacity exists to pump at levels higher than those assumed in this assessment, particularly during a temporary period such as an outage.

8.4.2 Regional Power Outage Scenarios

For a major emergency such as an earthquake, Pacific Gas and Electric (PG&E) has declared that in the event of an outage, power would be restored within a 24 hour period. For example, following the Northridge earthquake, Southern California Edison was able to restore power within 19 hours. Edison experienced extensive damage to several key power stations, yet was still able to recover within a 24 hour timeframe.

WKWD

In the event the SWP conveyance systems are damaged and are unable to deliver the raw water supply, WKWD has the ability to access alternative water supplies through WKWD's groundwater wells which will include four additional wells in the northern portion of the basin with a capacity of 100,000 AF.

8.5 Mandatory Prohibitions During Shortages

In January 2010, WKWD adopted a Water Shortage Response Plan which lists the mandatory prohibitions against specific water activities during times of water shortages. The prohibitions include specific changes in water use and educational components. The levels are additive and the higher levels of drought response are inclusive of the lower levels requirements (Table 8-5).

TABLE 8-5
RESPONSE LEVELS AND PROHIBITIONS

Prohibition	Stage When Prohibition is Mandatory			
	Level 1	Level 2	Level 3	Level 4
Public outreach for the implementation of water conservation practices	X	X	X	X
No washing down of paved surfaces		X	X	X
Hoses equipped with shut-off nozzle		X		
Avoid excessive runoff and waste.		X	X	X
Do not irrigate residential and commercial landscape between 10 am and 6 pm		X	X	X
Use bucket and a hand-held hose with a positive shut-off nozzle, mobile high-pressure/low-volume wash system, or at a commercial site that re-circulates (reclaims) water onsite to wash vehicles		X	X	X
Water served upon request at restaurants		X	X	X
Option to not launder towels and linens daily at hotels, motels, and other commercial lodging		X	X	X
Pools, spas, and ornamental fountains should be recirculating and leak proof.		X		X
No potable water for compaction or dust control if non-potable is available		X	X	X
No potable water for sewer system maintenance or fire protection training unless approved by General Manager.		X	X	X
Repair leaks within 24 hours.		X	X	X
No new potable services		X	X	X
Limited lawn watering per plan			X	X
Landscape irrigation no more than once per week except commercial nurseries, livestock, public works projects under construction, and not exceed 2x per week for public parks and schools, cemetery, golf course, and green belt				X
No car washing except at commercial carwashes				X

8.6 Consumptive Reduction Methods During Restrictions

8.6.1 Supply Shortage Triggering Levels

The agencies will manage water supplies to minimize the social and economic impact of water shortages. The Plan is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage. As the water purveyor, the West Kern Water District must provide the minimum health and safety water needs of the community at all times. The rationing program triggering levels shown below were established to ensure that this goal is met.

Rationing stages may be triggered by a shortage in one water source or a combination of sources. Although an actual shortage may occur at any time during the year, a shortage (if one occurs) is usually forecasted by the Water Department on or about April 1 each year.

The District's potable water sources are groundwater recharged with SWP and transfers/exchanges from local water districts. Rationing stages may be triggered by a supply shortage or by contamination in one source or a combination of sources. Because shortages overlap stages, triggers automatically implement the more restrictive stage. Specific criteria for triggering the District's rationing stages are shown in Tables 8-6 and 8-7.

TABLE 8-6
WATER DEFICIENCY TRIGGERING LEVELS

Stage	Percent Shortage
1	Up to 15 percent water deficiency
2	15 to 25 percent water deficiency
3	25 to 35 percent water deficiency
4	35 to >50 percent water deficiency

WKWD's supply is reliable and due to the various sources of supply is prepared for contingencies with the various supply reductions as shown in Table 8-7. For example, a stage one can be triggered by the criteria in Table 8-6 and one of the additional 5 criteria in Table 8-7.

TABLE 8-7
WATER DEFICIENCY STAGES AND ADDITIONAL TRIGGERING CRITERIA

Stage	Percent Shortage	Current Supply	Future Supply	Groundwater	Water Quality	Disaster
1	Up to 15 percent water deficiency	Total supply is 85-90 % of "normal" and below "normal: year is declared OR	Projected supply is insufficient to provide 80% of "normal" deliveries for the next two years OR	No excess groundwater pumping is performed OR	Contamination of 10% of water supply exceeding the primary drinking water standards	
2	15 to 25 percent water deficiency	Total supply is 75-85 % of "normal" and below "normal" year is declared OR	Projected supply is insufficient to provide 75% of "normal" deliveries for the next two years OR	First year of excess groundwater pumping taken must rely on banked water OR	Contamination of 20% of water supply exceeding the primary drinking water standards	
3	25 to 35 percent water deficiency	Total supply is 65-75 % of "normal" OR Fourth consecutive below "normal" year is declared OR	Projected supply is insufficient to provide 65% of "normal" deliveries for the next two years OR	First year of excess groundwater pumping taken must rely on banked water OR	Contamination of 30% of water supply exceeding the primary drinking water standards	
4	35 to >50 percent water deficiency	Total supply is less than 65% of "normal" OR Fifth consecutive below "normal" year is declared OR	Projected supply is insufficient to provide 50% of "normal" deliveries for the next two years OR	No excess ground water pumping available. OR Reduced groundwater pumping due to replenishment of aquifer.		Disaster Loss

8.6.2 New Demand

During a level 2 declared water shortage, WKWD shall not provide new potable water services, no temporary meters, no permanent meters and no statement of ability to service. Exceptions

to new demand are permits that have been issued, projects necessary for public health, safety, and welfare, or that water demands will be offset prior to the provision of a new water meter.

8.7 Penalties for Excessive Use

In January 2010, WKWD's adopted the Water Shortage Response Plan which addresses water conservation, shortage, drought, and emergency response procedures. The Plan states that no water user shall violate the provisions found in the plan and that the following penalties apply to each day the violation occurs.

- First Violation Upon notification or observation of waste or misuse of water, the District shall:
  - Make a photographic and written record of the violation; and
  - Provide notice to the customer in writing and/or by means of a door tag; and
  - Log the warning in the customer's account record.

- Second Violation - $300.00 Administrative Fee In the event a second violation occurs, the District shall:
  - Make a photographic and written record of the violation; and
  - Assess an administrative fee of $300.00 upon the customer for the second offense; and
  - Give notice to the consumer in writing that if such waste or misuse continues or subsequent violation occurs, the consumer will be subjected to escalating administrative fees and potential discontinuance of service; and
  - Log the warning in the customer's account record.

- Third Violation - $600.00 Administrative Fee Upon a third offense the District shall:
  - Make a photographic and written records of the violation; and
  - Assess an administrative fee of $600.00 upon the customer for the third offense; and
  - Give notice to the consumer in writing that if such waste or misuse continues or subsequent violation occurs, the consumer will be subject to discontinuance of service; and
  - Log the warning in the customer's account record; and
  - Report violation to appropriate law enforcement for possible criminal prosecution.

- Fourth Violation – Discontinuance of Service Upon a fourth offense the District shall:
  - Make a photographic and written report of the violation; and
  - Give written notice to the consumer that disconnection of the service will occur within five (5) working days of the date of the notice;
  - Disconnect the customer's service; and
  - Restoration and Reconnection fees will be charged in accordance to the District's Rules and Regulations. Service will be restored only when the customer has provided satisfactory evidence to the District indicating waste and unreasonable use of water will no longer occur.

8.8 Financial Impacts Of Actions During Shortages

WKWD has sufficient funds in their operating funds to supplement and deficiencies in revenue caused from a water shortage. Additionally water shortages will require additional pumping of groundwater which serves as the lowest water costs for WKWD.

8.9 Mechanism to Determine Reductions in Water Use

Demand

WKWD bills their customers on a monthly basis. The prior year's consumption is included on most customer bills. This allows comparison of the total consumption from each billing period to the same billing period from the prior year.

Production

Under normal water supply conditions, potable water production figures are recorded daily. An accounting sheet of water owed to WKWD, carryover from the previous year, and totals in the ground that have been banked are reviewed daily and tallied monthly.

Disaster Shortage

During emergency shortages, production figures are reported to the Supervisor hourly and to the Manager and the Water Shortage Response Team daily. Daily reports will also be provided to the Board of Directors.

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DWR Bulletin 132-05

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West Kern Water District System No. 1510022. June 29, 2009. Arsenic Blending Operations Plan.

West Kern Water District. 2010. Water Shortage Response Plan.

Appendix A

DWR Checklist

Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.3 Table 1-1
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Appendix B
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		After Title Page
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1.3.1 Table 1-1
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1.3.1
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1.3.1; Table 1-1 Table 1-2
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		After Title Page
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1.3

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1.3.1
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1.3
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 1.4
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 1.5 Section 1.6 Section 1.7
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2.3.3 Table 2-4
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3.3 Table 2-4
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2.5
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 2.4 Table 2-6 Table 2-7 Table 2-8 Table 2-9

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Not applicable
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Table 2-9
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 2.3 Table 2-2 Table 2-3
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Table 1-1 Section 6.3 Section 6.4
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 2.6 Table 2-10
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 3.1 Table 3-1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Yes

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 3.3.4 Appendix D
16	Describe the groundwater basin.	10631(b)(2)		Section 3.3.1
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		NO
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Not applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 3.3.1 Section 3.3.3 Section 3.3.4
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Table 3-4
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Table 3-5
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 3.4 Section 3.4.1 Table 3-6
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 3.5
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 3.6

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 4 Page 4-1
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Table 4-2
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Table 4-2 Table 4-3
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4 Table 4-1
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Table 4-3 Table 4-4
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Table 4-3 Table 4-4
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Appendix F Section 6.2
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 6.3 Section 6.4

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Table 6-1 Section 6.4.4
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Table 8-1 Table 8-2
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Table 8-4
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 8.4
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Table 8-5
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 8.6
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 8.7
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 8.8
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix F
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 8.9

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 5 Table 5-1
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Table 6-4 Table 6-5 Table 6-6
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 7
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 7
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 2.5.1 Section 7.5
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 7 for each DMM
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not a signatory

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

Appendix B

Public Notification and Outreach

April 21, 2011

Mr. Paul Gorte
Redevelopment Manager
City of Taft
209 E. Kern St
Taft, CA 93268

Subject: Notification of Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Dear Mr. Gorte:

Please note the corrected date of Tuesday, June 28, 2011, at 6:00 p.m. regarding the Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Apologies,

Gary Hamilton
Regulatory Administrator

West Kern water district

April 21, 2011

Mr. Paul Gorte
Redevelopment Manager
City of Taft
209 E. Kern St
Taft, CA 93268

Subject: Notification of Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Dear Mr. Gorte:

West Kern Water District is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing in its Urban Water Management Plan (UWMP) and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

The West Kern Water District, Board of Directors will take comments from the public then consider the plan for adoption. The public hearing will be held at 6:00 p.m. , on Tuesday, June 28, 2011. The hearing will take place at the West Kern water District Boardroom, located at 800 Kern St. Taft, California 93268.

If you have any questions please contact me at (661) 763-3151.

Sincerely,

Gary Hamilton
Regulatory Administrator

April 21, 2011

Ms. Lauren Bauer
Water Resources Planner
Kern County Water Agency
P.O. Box 58
Bakersfield, CA 93302-0058

Subject: Notification of Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Dear Ms. Bauer:

West Kern Water District is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing in its Urban Water Management Plan (UWMP) and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

The West Kern Water District, Board of Directors will take comments from the public then consider the plan for adoption. The public hearing will be held at 6:00 p.m. , on Tuesday, June 28, 2011. The hearing will take place at the West Kern water District Boardroom, located at 800 Kern St. Taft, California 93268.

If you have any questions please contact me at (661) 763-3151.

Sincerely,

Gary Hamilton
Regulatory Administrator

West Kern water district

April 21, 2011

Ms. Lorelei Oviatt
Director
County of Kern
Planning and Community Development
2700 M. Street Suite 100
Bakersfield, CA 93301-2370

Subject: Notification of Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Dear Ms. Oviatt:

West Kern Water District is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing in its Urban Water Management Plan (UWMP) and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

The West Kern Water District, Board of Directors will take comments from the public then consider the plan for adoption. The public hearing will be held at 6:00 p.m. , on Tuesday, June 28, 2011. The hearing will take place at the West Kern water District Boardroom, located at 800 Kern St. Taft, California 93268.

If you have any questions please contact me at (661) 763-3151.

Sincerely,

Gary Hamilton
Regulatory Administrator

West Kern water district

April 21, 2011

Mr. Daniel Ayala
City Manager
City of Maricopa
400 E. California St
Maricopa, CA 93252

Subject: Notification of Public Hearing for the 2010 West Kern Water District Urban Water Management Plan

Dear Mr. Ayala:

West Kern Water District is providing you with this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing in its Urban Water Management Plan (UWMP) and considering changes to the plan. Additionally, when a draft UWMP is available for public review, a copy will be sent to you.

The West Kern Water District, Board of Directors will take comments from the public then consider the plan for adoption. The public hearing will be held at 6:00 p.m. , on Tuesday, June 28, 2011. The hearing will take place at the West Kern water District Boardroom, located at 800 Kern St. Taft, California 93268.

If you have any questions please contact me at (661) 763-3151.

Sincerely,

Gary Hamilton
Regulatory Administrator

Appendix C

Purchase Agreement

Exhibit A, Doc. 1

AGREEMENT FOR BANKING
AND RECOVERY OF WATER

THIS AGREEMENT is made this 20th day of October, 1983, by and between WEST KERN WATER DISTRICT, a county water district (hereinafter referred to as "West Kern"), and BUENA VISTA WATER STORAGE DISTRICT, a California water storage district (herein referred to as "Buena Vista"),

W I T N E S S E T H:

WHEREAS, Buena Vista and West Kern have entered into an agreement dated November 23, 1965 entitled "AGREEMENT" (which is incorporated herein by this reference), and said document provides, among other things, for advance replacement of anticipated groundwater extractions by West Kern in excess of 3,000 acre feet each year ("Replacement Contract" herein); and

WHEREAS, West Kern and the Kern County Water Agency have entered into an agreement dated September 15, 1966 entitled "Contract Between Kern County Water Agency and West Kern County Water District For A Water Supply," which contract was amended by agreement dated June 13, 1968 entitled "Amendment No. 1 to Water Supply Contract Between Kern County Water Agency and West Kern County Water District" (which are incorporated herein by this reference), and said documents provide, among other things, for the Agency's supplying to West Kern an annual entitlement of California State Project water maximizing at 25,000 acre feet in 1990 ("Agency Contract" collectively herein); and

WHEREAS, West Kern and various other entities have entered into an agreement dated April 22, 1978 entitled "Agreement For Purchase, Banking and Delivery of Emergency Relief Water Among

the Kern County Water Agency, Lost Hills Water District and Banking Member Units" (which is incorporated herein by this reference), and said document provides, among other things, for the banking by West Kern of certain Lost Hills Water District water during the years 1979 through 1983, inclusive, and the replacement thereof by West Kern to Lost Hills out of West Kern's annual entitlement under its Agency Contract during the calendar years 1984 through 1988, inclusive ("Lost Hills Contract: herein)

WHEREAS, West Kern, Tehachapi-Cummings County Water District and the Kern County Water Agency have entered into an agreement dated February 29, 1980, entitled "Agreement Among Kern County Water Agency, Tehachapi-Cummings County Water District, and West Kern Water District For the Sale and Purchase of Water Surplus to the Needs of Tehachapi-Cummings County Water District" (which is incorporated herein by this reference), and said document provides among other things, for the purchase by West Kern of certain water available to Tehachapi-Cummings County Water District on an annual renewable basis ("Tehachapi-Cummings Contract" herein); and

WHEREAS, West Kern and Buena Vista have entered into a Memorandum of Understanding dated May 16, 1978 providing for the delivery by West Kern to Buena Vista of its entitlements from the Agency Contract and the Lost Hills Contract, and providing for the spreading and/or utilization of such water by Buena Vista in a manner consistent with West Kern's obligations under the Replacement Contract such that the use and distribution by Buena Vista will result in a credit to the groundwater bank account of West Kern as provided in said Replacement Contract; and

WHEREAS, said Memorandum of Understanding provides in Paragraph 12 thereof that the same would have independent force and effect unless and until merged into a more complete and detailed agreement between the parties, which such agreement was then contemplated and which such agreement could expand upon, amplify, or add to the terms of the Memorandum of Understanding, but could not materially contradict the same without the consent of both parties;

NOW, THEREFORE, IN CONSIDERATION of the foregoing recitals and of the covenants hereinafter contained, it is agreed:

1. Basic Supply: Each year, beginning with the calendar year 1984, West Kern shall deliver or cause to be delivered to Buena Vista, and Buena Vista shall take and use as provided herein West Kern's annual contract entitlement to State Project Water arising under and by virtue of the Agency Contract, the Lost Hills Contract and/or the Tehachapi-Cummings Contract, less such amounts thereof as West Kern may require from time to time, if any, to meet its pre-existing contractual commitments under that certain "Agreement to Terminate Water Service Contract" with Maurice Kophamer dated December 21, 1982. Buena Vista shall schedule delivery of such water in accordance with the terms and provisions of the contract applicable thereto.

2. Additional Water: It is recognized that West Kern may, from time to time, enter into other short and/or long-term arrangements for the enhancement of its water supply. Buena Vista agrees to cooperate with West Kern to take and use additional West Kern imported water hereunder as requested by West Kern, but

any expansion of the obligations of Buena Vista hereunder shall be at the sole option and in the sole discretion of Buena Vista and shall be subject to such reasonable rules, regulations and charges as Buena Vista may see fit to impose. Notwithstanding the foregoing, should West Kern obtain title to and offer Buena Vista Kern River water which qualifies as an imported supply to the Kern River groundwater basin, Buena Vista shall accept the same under this agreement but Buena Vista shall still be entitled to impose reasonable rules, regulations and charges and may likewise impose a requirement that West Kern provide therewith, at West Kern's expense, additional spreading facilities sufficient to enable Buena Vista to spread all of said water as it becomes available.

3. Banking and Recovery: Buena Vista agrees that all West Kern water delivered to and accepted by it under and pursuant to this agreement shall be credited to West Kern's groundwater recharge program under the Replacement Contract and, so far as Buena Vista is concerned, shall constitute acceptable recharge under the terms and provisions of said contract notwithstanding the actual use or disposition of such water by Buena Vista. It is further agreed that up to ninety-five percent (95%) of all water credited to West Kern as groundwater recharge may be pumped from the underground by West Kern and, for purposes of identification shall be presumed to be West Kern banked water of and from the original source subject to such limitations and restrictions as may have been applicable to water from such source.

4. Special Indemnity: Buena Vista agrees to defend and indemnify West Kern against liability resulting from any lawsuit instituted and maintained by a landowner or landowners within

the boundaries of Buena Vista seeking redress for injuries to lands within the boundaries of Buena Vista allegedly resulting from the utilization of water by Buena Vista and/or West Kern under and pursuant to the terms of this agreement. West Kern agrees to defend and indemnify Buena Vista against liability resulting from any lawsuit instituted and maintained by a landowner or landowners within the boundaries of West Kern alleged resulting from the utilization of water by West Kern and/or Buena Vista under and pursuant to the terms of this agreement. Except as herein expressly provided, neither party agrees to defend the other nor to indemnify the other against liability for injuries to lands and/or with respect to lawsuits seeking injunctive relief where the alleged injury or request for injunctive relief arises out of or is based upon any purported illegality or unenforceability of any rights or obligations created hereunder.

5. Methods of Recharge: Buena Vista shall effect a groundwater recharge and banking program with West Kern water delivered to it hereunder by either of the following two (2) methods:

(a) Direct recharge by delivery of West Kern's water (or other water available to Buena Vista in lieu thereof) in, over, upon and through Kern River and/or Buena Vista and/or West Kern works and facilities (including the Main Canal and other unlined canals and including the spreading areas and facilities to be developed pursuant to Paragraph 6 hereof) for percolation purposes generally in the vicinity of West Kern's wellfield; or

(b) Indirect recharge by delivery of West Kern's water to certain landowners within Buena Vista whereby such delivery will result in a reduction in groundwater pumping generally in the southern portion of the main body of Buena Vista. Buena Vista shall determine, in its sole discretion, the annual proportionate amounts of said West Kern water which will be assigned to direct recharge and which will be assigned to indirect recharge.

6. Facilities, Structures and Improvements:

(a) To accommodate the taking, distributing and spreadir of West Kern water under and pursuant to this agreement, Buena Vista may acquire, own and improve for its use the so-called "Rosedale Turnout" in the California Aqueduct at West Kern's sole cost and expense. Buena Vista shall use its best efforts to acquire, own and improve for its and West Kern's use a spreading area of approximately 160 acres in and around the vicinity of West Kern's wellfield, and shall provide all facilities that may be required for the delivery of water to said spreading area as contemplated by the terms and provisions of this agreement, all at the sole cost and expense of West Kern. If Buena Vista is unable to acquire ownership of said "Rosedale Turnout," or should Buena Vista (at its option) choose not to acquire said "Rosedale Turnout," it may then develop an alternate program to improve and rent use of said turnout or to construct a new turnout of such capacity and at such location as shall be selected by Buena Vista in its sole discretion. All costs of an alternate program involving the improvement and rental of the Rosedale Turnout shall be paid by West Kern or, alternatively, if a new Buena Vista

turnout should be constructed, then West Kern shall pay all costs thereof; provided, however, in no event shall the costs paid by West Kern under an alternate program exceed the cost of acquiring and improving the "Rosedale Turnout" as provided above (which "cost" shall be derived by mutual agreement of the parties).

(b) In addition to the foregoing, Buena Vista may request development of additional recharge areas, if deemed necessary for purposes of this agreement, in the vicinity of West Kern's wellfield (such as in the Elk Pen Reserve and the Kern River channel upstream of the Richfield Weir, including reconstruction or improvement of said Weir). In the event Buena Vista makes such request the parties will share equally the expense of such improvements but the improvements will be owned by Buena Vista.

(c) Any facilities constructed pursuant to this agreement which are owned by one party shall be operated, maintained and repaired by and at the sole cost and expense of such party (including capital expenditures for improvement or replacement following initial construction).

(d) Buena Vista shall advance all funds necessary to meet the financial obligations of West Kern under subparagraphs (a) and (b) of this paragraph 6. West Kern shall reimburse Buena Vista advances, plus interest in an amount equal to the approximate amount of interest Buena Vista would have earned but for the advances, at such time as West Kern receives funds arising out of or relating to a project sponsored by West Kern similar in scope to the so-called "1984 Industrial Water Project". If West Kern terminates this agreement pursuant to subparagraph (b)

of paragraph 11 prior to the occurrence of that condition which gives rise to a reimbursement of Buena Vista as provided above, then and in such event Buena Vista shall still be entitled to reimbursement of all or some portion of the said advances as hereinafter specified, to wit: (i) there shall be established a ten (10) year refund period for each project which shall commence on the first day of January of the year following the year in which the acquisition of any property and/or the construction of any improvements pursuant to this agreement has begun and terminating December 31st of the ninth (9th) year following the year in which such refund period commences; (ii) the refund to which Buena Vista will be entitled shall be equal to the total amount advanced for a given project, divided by ten (10), times the number of years remaining in the refund period as of the date of termination; (iii) said refund amount shall be due and payable in full within thirty (30) days after the date of termination; and (iv) delinquent amounts shall bear interest at ten (10) percent per annum.

7. Measurements and Records: Buena Vista shall provide all measurements and records required for the groundwater recharge program.

8. Costs and Charges: West Kern shall be responsible for and shall pay in a timely manner when due all costs and charges relating to West Kern water delivered to Buena Vista hereunder, all costs and charges relating to the recovery of its groundwater supply by West Kern, and all costs and charges relating to the operation, maintenance or repair of West Kern works and facilities.

Buena Vista shall be responsible for and shall pay in a timely manner when due all costs and charges relating to the operation, maintenance or repair of Buena Vista works and facilities and the handling of West Kern water from the point of delivery to Buena Vista.

9. Delivery Point: West Kern's state water shall be delivered to Buena Vista at turnouts designated by Buena Vista within or above reach 13B of the California Aqueduct.

10. Resale: If in any year West Kern has water available under the Agency Contract for delivery to Buena Vista hereunder and, in such year, Buena Vista finds it is unable to spread or make a reasonable beneficial use of such water, taking into account all other waters available to Buena Vista, then West Kern, upon Buena Vista's request, shall arrange for the disposal of said State water under the terms of said Agency Contract. Any net revenue or savings accruing to West Kern as a result shall be paid to Buena Vista and West Kern shall receive a credit that year pursuant to paragraph 3 hereof notwithstanding Buena Vista's inability to take said water. Buena Vista agrees that it will not exercise the option herein provided except during high runoff years on the Kern River, i.e., one hundred twenty-five (125%) percent of normal or greater.

11. Term:

(a) The term of this agreement shall be concurrent and co-extensive with each underlying agreement giving rise to a West Kern water supply, i.e., as respects water made available under the Agency Contract, the term of this agreement shall be concurrent and co-extensive with said Agency Contract. Neither

party, without the consent of the other party, will do or suffer anything to be done, including acts of omission, which might or could lead to the early termination or cancellation of any underlying agreement.

(b) Notwithstanding anything to the contrary herein, West Kern shall have the absolute and unequivocal right to terminate this agreement at any time, with or without notice, if and to the extent (i) West Kern is for any reason, except a default or improper act by West Kern, unable to meet its water demands from its existing wellfield or any other source (including future sources not now in contemplation) and (ii) West Kern's termination of this agreement is for the purpose of meeting its water demands by direct delivery to its customers from the California Aqueduct of the State Water Project. A termination of this agreement by West Kern pursuant to this subparagraph (b) of paragraph 11 shall likewise terminate any right which West Kern may have under this agreement, including without limitation the right to use any of the facilities, structures or improvements constructed by Buena Vista pursuant to subparagraphs (a) and (b) of paragraph 6 whether or not all or some portion of the costs thereof have been reimbursed or are reimbursable to Buena Vista pursuant to subparagraph (d) of said paragraph 6.

12. Approvals: Both parties shall cooperate in securing any and all necessary or appropriate governmental approvals.

13. Notice: Any notice, request, tender, demand, delivery, approval or other communication provided for, required or arising under this agreement shall be in writing and shall be deemed

delivered if delivered in person to an individual, or an officer of a corporate party, or, if mailed, three business days following deposit in the United States mail, registered or certified, return receipt requested, postage prepaid, addressed to the party or parties at the address or addresses in this section provided or at such other address or addresses of which such party may give notice in accordance with the provisions of this paragraph

West Kern: West Kern Water District
P. O. Box MM
Taft, California 93268

Buena Vista: Buena Vista Water Storage District
1400 Easton Drive, #140A
P. O. Box 10478
Bakersfield, California 93389

14. General Indemnity: Each party agrees to protect, defend, indemnify and hold harmless the other party, its officers, agents, servants, employees and consultants, from and against any and all losses, claims, liens, demands and causes of action of every kind and character on account of personal injuries or death or damages to property and, without limitation by enumeration, all other claims or demands of every character occurring or in any wise incident to, connected with, or arising directly or indirectly out of the performance or non-performance by the indemnifying party hereunder. The provisions of this general indemnity shall at all times be subject to the more specific provisions contained in paragraph 4 hereof, whether or not said more specific provisions impose or restrict liability of one party to another.

15. Water Quality: Neither party guarantees the quality of water made available to the other party hereunder; provided, however, Buena Vista may refuse to accept delivery of any West Kern water, other than State Project water, containing total

dissolved solids in excess of 450 parts per million.

16. Successors and Assigns: The terms and provisions of this agreement shall bind and shall inure to the benefit of the successors and assigns of the respective parties hereto.

17. Attorneys Fees: In the event of litigation between the parties with respect to this agreement, including the interpretat or enforcement of any of the terms and provisions hereof, the prevailing party in such litigation shall be entitled to recover reasonable attorneys' fees to be fixed by the Court in such proceeding in addition to any other relief provided.

18. Novation: That certain Memorandum of Understanding entered into by and between Buena Vista and West Kern on May 16, 1978 is terminated and cancelled concurrently with the execution of this agreement and this agreement shall be considered a novation with respect to said prior agreement; provided, however, water delivered to groundwater banking under said interim agreemen shall be recoverable (on a "first in - first out" basis) in accordance with the terms and conditions of said interim agreement and not in accordance with this agreement.

19. Force Majeure: Except as otherwise provided herein, all obligations of the parties hereto shall be suspended for so long as and to the extent that the performance thereof shall be prevented by earthquakes, fires, tornadoes, facility failures, floods, drownings, strikes, other casualties or acts of God, orders of court or governmental agencies having jurisdiction of the subject matter thereof or other events or causes beyond the control of the parties hereto.

IN WITNESS WHEREOF, the parties have hereunto set their hands and the seals of the Districts the day and year first

above written.

BUENA VISTA WATER STORAGE DISTRICT

By _____
Its President

By _____
Its Secretary

WEST KERN WATER DISTRICT

By _____
Its President

By _____
Its Secretary

APPROVED AS TO FORM:

McMURTREY & ETCHEVERRY

By: _____
GENE R. McMURTREY
Attorneys for BUENA VISTA WATER STORAGE DISTRICT and WEST KERN WATER DISTRICT

Appendix D

Groundwater Management Plan

Please see CD

Appendix E

Ordinance 10-1

BEFORE THE BOARD OF DIRECTORS
OF
WEST KERN WATER DISTRICT

In the Matter of:	)	
	)	
Rescinding Ordinance 00-1	)	ORDINANCE NO. 10-1
And Implementing a Water	)	
Shortage Response Plan	)	

THE WEST KERN WATER DISTRICT DOES ORDAIN as follows:

Pursuant to the authority granted to the District by Sections 31024 through 31027 of the Water Code, it is hereby ordained by the West Kern Water District Board of Directors as follows:

1. That Ordinance No. 00-1 Prohibiting the Waste of Water is rescinded.
2. That in order to conserve the District's water supply for the greatest public benefit, and to reduce the quantity of water used by the District's customers, it is necessary to implement water conservation/restriction measures as outlined in the Water Shortage Response Plan.

SECTION I. PURPOSE

The purpose of this Water Shortage Response Plan Ordinance is to inform West Kern Water District (WKWD) customers and interested parties of: (1) any local and regional water supply shortage situation, (2) the policies by which WKWD will implement and administer measures to address water shortages, (3) the conservation/restriction measures WKWD will undertake to ensure adequate water supplies to its customers; and (4) the process by which penalties will be imposed for violations and process by which customers may appeal.

SECTION II. WATER SHORTAGE RESPONSE PLAN

In response to a state, county or District water supply shortage, WKWD will implement conservation measures as outlined in the attached West Kern Water District Water Shortage Response Plan (WSRP), together with any future amendments thereto. The WSRP is designed to ensure adequate supplies for customers without depleting the District's water supply to the extent that there may be insufficient water for human consumption, sanitation, and fire protection.

In addition to voluntary conservation measures, it may become necessary to implement mandatory compliance measures to ensure conservation. If this occurs, WKWD may implement measures as outlined in one or more of the WSRP's Response Levels, which are commensurate with the severity of the

water supply situation and in accordance with this ordinance and resolutions, which may be adopted.

The following principles will guide WKWD's implementation of these measures:

a) Communication and Outreach - WKWD staff will ensure timely and appropriate communication with the WKWD Board of Directors, customers, including residential, commercial and industrial customers, businesses, governmental bodies and schools.

b) Appropriate water use practices/conservation measures shall be utilized as needed to accomplish goals, limiting financial impacts and/or shut-offs to those customers who fail to meet conservation measures including fines up to $600.00, criminal penalties, and discontinuance of water service.

c) An appeal process shall be available to all customers.

SECTION III. SEVERABILITY

If any section or portion of this Ordinance including the Water Shortage Response Plan attachment is found to be invalid, the District hereby declares such decision shall not affect the validity of the remaining portions of this Ordinance or any part thereof.

SECTION IV. EFFECTIVE DATE

Before the expiration of fifteen (15) days after its passage, this Ordinance shall be published in a newspaper of general circulation, printed and published in the City of Taft. This Ordinance shall take effect immediately after publication.

The foregoing Ordinance was introduced at a meeting of the Board of Directors of the West Kern Water District on January 26, 2010, and adopted at said meeting by the following vote:

AYES: President Stephen J. Steinhoffer
Vice President David A. Wells
Director Charles H. Comfort
Director Gary J. Morris

NOES:

ABSTAIN:

ABSENT: Director Thomas M. LecLair

STEPHEN J. STEINHOFFER,
President of the Board of Directors
of the West Kern Water District

SECRETARY'S CERTIFICATE

I, JERRY W. PEARSON, being the appointed Secretary of the WEST KERN WATER DISTRICT, do hereby certify that the above and foregoing ORDINANCE 10-1 was duly adopted by the Board of Directors of said District at a legally convened meeting of said Board held on the 26th day of January, 2010, that the above and foregoing is a full, true, and correct copy of ORDINANCE 10-1, and that the same has not been amended or repealed.

ATTEST:

JERRY W. PEARSON, Secretary of the Board of Directors of the West Kern Water District

(SEAL)

Appendix F

Water Shortage Contingency Plan

WATER SHORTAGE RESPONSE PLAN

West Kern Water District
800 Kern Street
Taft, CA 93268
(661) 763-3151

May 2011

Table of Contents

I. POLICY

This Policy shall be known as the West Kern Water District Water Shortage Response Plan ("WSRP" or "Policy").

Article 10, Section 2 of the California Constitution declares that waters of the state are to be put to beneficial use, that waste, unreasonable use, or unreasonable method of use of water be prevented, and that water be conserved for public welfare.

West Kern Water District may experience shortages due to drought conditions, regulatory restriction enacted upon imported supplies, catastrophic emergencies, and other factors.

Conservation of current water supplies and minimization of the effects of water supply shortages that are the result of drought are essential to the public health, safety and welfare.

Regulation of the time of certain water use, manner of certain water use, design of rates, method of application of water for certain uses, installation and use of water-saving devices, provide an effective means of conserving water.

California Water Code Section 31020 et seq. authorizes a county water district to adopt and enforce an ordinance giving such power to restrict the use of water caused by a drought or other water shortage threats and to enforce penalties of restriction violations.

In addition, California Water Code Sections 375 et seq. authorizes a water supplier to adopt and enforce a comprehensive water conservation program.

Adoption and enforcement of a comprehensive water conservation program will allow the West Kern Water District ("District") to delay or avoid implementing measures such as water rationing or more restrictive water use regulations pursuant to a declared water shortage emergency as authorized by California Water Code Sections 350 et seq.

West Kern Water District has adopted an Urban Water Management Plan that includes water conservation as a necessary and effective component of its programs to provide a reliable supply of water to meet the needs of the public within its service territory. The District's Urban Water Management Plan also includes a contingency analysis of actions to be taken in response to water supply shortages (Water Shortage Contingency Plan). This policy is consistent with the Urban Water Management Plan adopted by the District.

The Water Shortage Contingency Plan contains four stages describing actions to be taken to lessen or avoid supply shortages. The WSRP contains water shortage response levels (Response Level 1 through Response Level 4) that correspond with the stages (Stage I through Stage IV) in the District's Urban Water Management Plan.

The water conservation measures and restrictions on water use and method of use identified by this Policy provides important information to water users to plan water use and enables the District to implement water management measures, including the control or restriction of water use, in a fair and orderly manner for the benefit of the public.

II. DECLARATION OF NECESSITY AND INTENT

The District in the declaration of necessity and intent finds the following:

a. This policy establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water within the District in order to assure adequate supplies of water to meet the needs of the public, and further the public's health, safety, and welfare, recognizing that water is a limited natural resource that requires careful management not only in times of drought but at all times.

b. This policy establishes progressive response levels including regulations to be implemented during times of declared water shortages or declared water shortage emergencies. It establishes four levels of response actions to be implemented in times of shortage, with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies.

c. Level 1 condition shortage response measures are voluntary and will be reinforced through local and regional public education and awareness measures that may be funded in part by the District. During response condition Levels 2 through 4, all conservation measure and water-use restrictions are mandatory and become increasingly restrictive in order to attain escalating conservation goals.

d. During Response Level 2 condition or higher, the water conservation measures and water use restrictions established by this policy are mandatory and violations are subject to criminal, civil, and administrative penalties and remedies specified in this policy.

III. DEFINITIONS

The following words and phrases whenever used in the WSRP will have the meaning defined in this Section:

a. "District" means the West Kern Water District.
b. "WSRP" refers to West Kern Water District's Water Shortage Response Plan in existence on the effective date of this ordinance and as readopted or amended from time to time, or an equivalent plan of the District to manage or allocate supplies during shortages.
c. "Customer" means any person, business, corporation, public or private entity, public or private association, public or private agency, government agency or institution, school district, college, or any other user of water provided by West Kern Water District.
d. "Drought" will mean any shortage in water supply based upon expected demands that are caused by hydrological, environmental, legislative, judicial actions, or by infrastructure failure.
e. "Water" will refer to potable water, unless otherwise specified.
f. "Water Conservation" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.
g. "Days" are defined as calendar days, unless otherwise indicated.
h. "Reasonable Probability" refers to potential reductions due to shortages due to drought conditions, regulatory restriction enacted upon imported supplies, catastrophic emergencies, and other factors.
i. "Waste/Unreasonable Use" means among other things, violations of the restrictions set forth in this policy at each specific response level.

IV. APPLICATIONS

The provisions of this policy apply to all customers using water provided by West Kern Water District.

Nothing in this policy is intended to affect or limit the ability of the District to declare and respond to an emergency, including an emergency that affects the ability of the District to supply water.

V. WATER SHORTAGE RESPONSE LEVELS

RESPONSE LEVEL 1 – Water Shortage "Water Awareness"

A Response Level 1 condition is also referred to as a "Water Awareness" condition. A Level 1 condition applies when there is reasonable probability there will be supply reductions. Existence of a Response Level 1 – Water Awareness condition is ongoing and the District shall take

action to implement the Level 1 conservation practices identified in this policy.

During a Level 1 condition, the District will increase public education and outreach efforts to emphasize public awareness of the need to implement voluntary water conservation practices. (The same water conservation practices become mandatory as noted in Response Level 2 if the District declares a Level 2 Alert / Water Restriction condition).

RESPONSE LEVEL 2 – Water Shortage "Alert/Water Restrictions"

A water shortage Level 2 condition is also referred to as an "Alert/Water Restriction" condition. A Level 2 condition applies when the District notifies its customers to reduce water usage due to drought or other reduction in supplies. The West Kern Water District Board of Directors shall declare the existence of a Response Level 2 condition and implement the mandatory Level 2 conservation measures identified in this Policy. The Water Supply Shortage Stages and Conditions set forth in Appendix A shall be implemented accordingly.

In addition to the Water Supply Shortage Stages and Conditions, all persons using District water shall continue to comply with Level 1 "Water Awareness" conservation practices during a Level 2 "Alert/Water Restriction," condition and shall comply with the following mandatory conservation measures:

1. Hoses shall be equipped with shut-off nozzle. Do not hose down driveways, street/parking lot, sidewalks, or buildings unless necessary for health or safety.

2. Avoid excessive watering that runs off onto sidewalks, streets or gutters.

3. Do no irrigate residential and commercial landscape between the hours of 10 a.m. and 6 p.m. Consider limiting lawn watering and landscape irrigation run time should be adjusted to avoid runoff.

4. Washing of motor vehicles, trailers, boats and other types of equipment shall only be done using a bucket and/or a hand-held hose with a shut-off nozzle, high pressure/low volume wash system, or at a commercial site that recirculates water on-site. Avoid washing during hot conditions when additional water is required due to evaporation.

5. Restaurants shall serve water only upon request.

6. Offer guests in hotels, motels, and other commercial lodging establishments the option of not laundering towels and linens daily.

7. Pools, spas, and ornamental fountains/ponds should be recirculating and leak proof. Draining and refilling is only permitted for health, maintenance or structural reasons.

8. Stop use of potable water for compaction or dust control where non-potable or recycled water is available.

9. Stop use of potable water for sewer system maintenance or fire protection training without prior approval by the General Manager.

10. Repair all leaks within twenty-four (24) hours of notification by the District unless other arrangements are made with the General Manager.

Upon declaration of a Response Level 2 condition, no new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statement of immediate ability to serve or provide potable water service such as will serve letters shall be issued, except under the following circumstances:

1. A valid, unexpired building permit has been issued for the project; or

2. The project is necessary to protect the public's health, safety, and welfare; or

3. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.

This provision does not preclude restoring service that has been interrupted.

RESPONSE LEVEL 3 – Water Shortage "Critical/Water Reduction Condition"

A Response Level 3 condition is also referred to as a "Critical / Water Reduction Condition." A Level 3 condition applies when increasing cutbacks caused by continued drought or disaster. The West Kern Water District Board of Directors shall declare the existence of a Response Level 3 condition, and shall declare a critical water shortage pursuant to California Water Code Section 350, and shall implement the Level 3 conservation measures identified in this policy. The Water Supply Shortage Stages and Conditions set forth in Appendix A shall be implemented accordingly.

In addition to the Water Supply Shortage Stages and Conditions, all persons using West Kern Water District water shall comply with Level 1 and Level 2 water conservation practices during a Level 3 Critical/Water Reduction condition and shall comply with the following additional mandatory conservation measures.

1. Limit lawn watering and landscape irrigation to no more than a total of ten (10) minutes per watering station per assigned day as follows: Residents with even street number addresses water on Wednesday, Friday, and Sunday. Residents with odd number addresses water on Tuesday, Thursday, and Saturday. No watering is allowed on Monday. (These restrictions apply to manual and automatic watering.) Irrigation run time shall be adjusted to avoid runoff.

RESPONSE LEVEL 4 – Water Shortage "Emergency/Water Curtailment Condition"

A Response Level 4 condition is also referred to as an "Emergency / Water Curtailment Condition." A Level 4 condition applies when the District's Board of Director's declares a water shortage emergency pursuant to California Water Code Section 350 and notifies its customers that Level 4 requires a demand reduction in order for the District to have supplies available to meet basic needs. West Kern Water District shall declare an "Emergency/Water Curtailment" condition in the manner and on the grounds provided in California Water Code Section 350. The Water Supply Shortage Stages and Conditions set forth in Appendix A shall be implemented accordingly.

In addition to the Water Supply Shortage Stages and Conditions, all persons using District's water shall comply with conservation measures required during Level 1 "Water Awareness" condition, Level 2 "Alert/Water Restriction" condition, and Level 3 "Critical/Water Reduction" condition

and shall comply with the following additional mandatory conservation measures:

1. Limited residential and commercial landscape irrigation to no more than once per week. Residents and commercial businesses with odd street number addresses water on Tuesday. Residents and commercial businesses with even street number addresses water on Wednesday. No watering is allowed on Monday, Thursday, Friday, Saturday or Sunday. (These restrictions apply to manual and automatic watering.) Irrigation run time shall be adjusted to avoid runoff.

2. This restriction shall not apply to the following categories of use:

    a. Landscape products of commercial nurseries.

    b. Maintenance of landscaping within public parks and playing fields, school grounds, cemetery, green belts, and golf courses, provided such irrigation does not exceed two (2) days per week according to the schedule set forth in Section IV. WATER SHORTAGE RESPONSE LEVEL 2 – Number 3 and Section IV. WATER SHORTAGE RESPONSE LEVEL 3 – Number 1.

    c. Watering of livestock, and,

    d. Public works projects under construction.

3. Stop washing vehicles except at commercial carwashes that re-circulate water, or by high pressure/low volume wash systems.

The water shortage response levels identified in this policy correspond with the District's UWMP's stages as identified in the following table:

RESPONSE LEVELS	RESTRICTIONS	CONSERVATION TARGET	URBAN WATER MANAGEMENT PLAN STAGES
Level 1 – *Water Awareness*	Voluntary	Up to 15%	Stage 1 and 2
Level 2 – *Water Restrictions*	Mandatory	15% - 25%	Stage 2 and 3
Level 3 – *Critical/Water Reduction*	Mandatory	25% - 35%	Stage 3 and 4
Level 4 – *Emergency/Water Curtailment*	Mandatory	35% - 50%	Stage 4

VI. PROCEDURES FOR DETERMINATION AND NOTIFICATION OF WATER SHORTAGE RESPONSE LEVELS

The existence of a Water Shortage Response Level 1 condition shall be ongoing when declared by Board action. Declaration of Level 1 may be declared upon reaching:

a. Consecutive three year state-wide drought; and
b. District cannot obtain 15% of District annual demand (based on previous year) of all water supplies determined annually by June 1st.
   Note: Water supplies include State Water Project and all other water supplies available to District.

The existence of a Water Shortage Response Level 2 or Level 3 conditions may be declared by resolution of the West Kern Water District Board of Directors adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation measures applicable to Response Level 2 or Level 3 conditions shall take effect on the tenth (10) day after the date the response level is declared. Within five (5) days following the declaration of the response level, the District shall publish a summary of the resolution in one or more newspapers. The District may also post notice of the condition on its website.

The existence of a Water Shortage Response Level 4 condition may be declared in accordance with the procedures specified in California Water Code Sections 351 and 352. The mandatory conservation measures applicable to Response Level 4 conditions shall take effect on the tenth (10) day after the date the response level is declared. Within five (5) days following the declaration of the response level, the District shall publish a summary of the resolution in one or more newspapers. The District may also post notice of the condition on its website.

The District's Board of Directors may declare an end to a Water Shortage Response Level 2 or higher by the adoption of a resolution at any regular or special meeting held in accordance with state law.

VII. VIOLATIONS AND PENALTIES

Any person, who uses, causes to be used, or permits the use of water in violation of this policy is guilty of an offense punishable as provided herein.

Each day that a violation of this policy occurs is a separate offense.

Violation of a provision of this policy may be subject to enforcement through installation of a flow-restricting device in the service meter. If a flow-restrictor is placed in the service, the violator shall pay the cost of the material and labor for device installation and removal.

Willful violations of the mandatory conservation measures and water use restrictions as set forth in this policy may be enforced by discontinuing service to the property at which the violation occurs as provided by Water Code Section 356. Violations may also be subject to criminal, civil, and administrative penalties and remedies specified in this policy. If water service is disconnected, restoration shall be according to the District's Rules and Regulations.

All remedies provided for herein shall be cumulative and not exclusive for the duration of the declared water shortage emergency.

First Violation

Upon notification or observation of waste or misuse of water, the District shall:

a. Make a photographic and written record of the violation; and
b. Provide notice to the customer in writing and/or by means of a door tag; and
c. Log the warning in the customer's account record.

Second Violation - $300.00 Administrative Fee

In the event a second violation occurs, the District shall:

a. Make a photographic and written record of the violation; and
b. Assess an administrative fee of $300.00 upon the customer for the second offense; and
c. Give notice to the consumer in writing that if such waste or misuse continues or subsequent violation occurs, the consumer will be subjected to escalating administrative fees and potential discontinuance of service; and
d. Log the warning in the customer's account record.

Third Violation - $600.00 Administrative Fee
Upon a third offense the District shall:

a. Make a photographic and written records of the violation; and
b. Assess an administrative fee of $600.00 upon the customer for the third offense; and
c. Give notice to the consumer in writing that if such waste or misuse continues or subsequent violation occurs, the consumer will be subject to discontinuance of service; and
d. Log the warning in the customer's account record; and
e. Report violation to appropriate law enforcement for possible criminal prosecution.

Fourth Violation – Discontinuance of Service
Upon a fourth offense the District shall:

a. Make a photographic and written report of the violation; and
b. Give written notice to the consumer that disconnection of the service will occur within five (5) working days of the date of the notice;
c. Disconnect the customer's service; and
d. Restoration and Reconnection fees will be charged in accordance to the District's Rules and Regulations. Service will be restored only when the customer has provided satisfactory evidence to the District indicating waste and unreasonable use of water will no longer occur.

VIII. APPEALS

The District recognizes there may be mitigating or intervening circumstances bearing upon a customer's apparent misuse of water. Upon receipt of any notice regarding purported misuse or waste of water, the customer shall have five (5) working days within which to file a written request for reconsideration with the General Manager. If the customer is not satisfied with the General Manager's decision, the customer shall have fifteen (15) days after the General Manager's decision within which to file a written appeal to the Board of Directors. The Board shall conduct a hearing on the appeal at the next regularly scheduled Board meeting immediately following the appeal. The Board's decision following such hearing shall be final and conclusive.

IX. EFFECTIVE DATE

The policy is effective immediately upon adoption and publication or as otherwise established by state law for West Kern Water District.

West Kern Water District - Water Supply Shortage Stages & Conditions
Entitlement/Banked Water Overview

STAGES	% REDUCTION maximum used for calculations (1)	DISTRICT DEMAND Historical High 2007 (2)	DEMAND MINUS REDUCTION	DEMAND SHORTFALL	CUSTOMER REDUCTION	DISTRICT FROM BANKED WATER		DISTRICT BANKED WATER ACCOUNT 206,000	YEARS UNTIL BANK ACCOUNT IS DEPLETED
	AF	AF	AF	AF	AF	AF			
I	15% voluntary	27,666	23,516	4,150	0 (3)	4,150	**Customer 50%**	201,850	48.64
II	15% to 25%	27,666	20,750	6,917	3,458	3,458	**District 50%**	198,392	57.37
III	25% to 35%	27,666	17,983	9,683	4,841	4,841		193,551	39.98
IV	35% to 50%	27,666	13,833	13,833	6,916	6,916		186,635	26.99

(1) For purpose of maximum impact higher percentage was used for persentage reduction calculation
(2) Includes supplying La Paloma 4,500 AF/Yr and utilizes maximum water delivery year of 2007
(3) STAGE I - request 15% voluntary customer reduction and District will supply shortfall from banked water account

ACTION	
1	BOD determined plan goes into action when; a) Consecutive three year State-wide drought occurs and b) District cannot obtain 15% of District annual demand (based on previous year) of all water supplies determined annually by June 1st Note: Water supplies include State Water Project and all other water supplies available to District
2	BOD adopts conservation measures of "Water Shortage Response Plan Ordinance NO. 10-1"
3	In order to enact Stage II or higher of the Ordinance NO. 10-1, BOD will need to adopt Resolution declaring a Water Shortage Emergency
4	Reduce by 25%/35% large landscape watering (parks, schools, ball fields, golf course, cemetary, green belt)
5	Eliminate all over-use of contracted water to industrial customers
6	Reduce by 35%/77% non contracted industrial customers
7	Reduce by 10%, contracted industrial customers, excluding large landscape watering
STAGE	
I	Public conservation education program/request customer voluntary reduction
II	Public conservation education program/request reduction
II	BOD enforces conservation measures of " Water Shortage Response Plan Ordinance NO. 10-1" Domestic water - voluntary conservation and mandatory rationing account for 20 to 30 % reduction (reference DWR,EPA)
II	Reduce up to 25% large landscape watering
II	Eliminate all over-use of contracted water to industrial customers
II	Reduce up to 35% non contracted industrial customers
III	Public conservation education program/request customer reduction
III	Water Shortage Response Plan Enforced
III	Reduce up to 25% large landscape watering
III	Eliminate over-use of contracted water to industrial customers
III	Reduce up to 77% non contracted industrial customers
IV	Public conservation education program/request customer reduction
IV	Water Shortage Response Plan Enforced
IV	Reduce up to 35% large landscape watering
IV	Eliminate over-use of contracted water to industrial customers
IV	Eliminate non contracted industrial customers
IV	Reduce up to 10% contracted industrial customers, excluding large landscape watering
IV	Reduce up to 10% OEHI
IV	Reduce up to 10% Elk Hills Power

STAGE I 15%	District Can Meet Current Demands	REDUCTION %	ESTIMATED ACRE FEET	ESTIMATED REDUCED REVENUE $ Annual Revenue	Reduction
Public conservation education program					
STAGE II 25%	**Reduce Customer Usage By 3,458 acre feet**				
Public conservation education program/request voluntary reduction		Cost		$11,000	$11,000
BOD enforces conservation measures of Ordinance NO. 10-1		20%	834	$2,262,109	$452,422
Reduce large landscape watering		25%	203	$1,563,778	$390,945
Eliminate over-use of contracted water to industrial customers		100%	1,225	$1,302,851	$1,163,260
Reduce non contracted industrial customers		35%	1,170	$3,766,549	$1,318,292
			3,432		$3,335,918
STAGE III 35%	**Reduce Customer Usage By 4,841 acre feet**				
Public conservation education program/request voluntary reduction		Cost		$11,000	$11,000
BOD enforces conservation measures of Ordinance NO. 10-1		20%	834	$2,262,109	$452,422
Reduce large landscape watering		25%	203	$156,378	$39,095
Eliminate over-use of contracted water to industrial customers		100%	1,225	$1,302,851	$1,302,851
Reduce non contracted industrial customers		77%	2,575	$3,766,549	$2,900,243
Reduce contracted industrial customers		0%	0	$5,099,592	$0
	OEHI	0%	0	$118,496	$0
	* La Paloma			$2,183,597	$0
	Elk Hills Power	0%	0	$208,992	$0
	* Sunrise			$2,207,744	$0
	* Short Term Industrial			$9,744	$0
			4,837		$4,705,610

* Have their own water and may not be reduced until their water is depleted

DEMAND AF	STAGE IV	Reduce Customer Usage By 6,916 acre feet				
	50%		Cost		$11,000	$11,000
4,169	BOD enforces conservation measures of Ordinance NO. 10-1		25%	1,042	$2,262,109	$565,527
812	Reduce large landscape watering		35%	284	$156,378	$54,732
1,225	Eliminate over-use of contracted water to industrial customers		100%	1,225	$1,302,851	$1,163,260
3,344	Eliminate non contracted industrial customers		100%	3,344	$3,766,549	$3,766,549
5,050	Reduce contracted industrial customers		10%	505	$5,099,592	$509,959
2,200		OEHI	10%	220	$118,496	$11,850
4,500		* La Paloma			$2,183,597	$0
3,000		Elk Hills Power	10%	300	$208,992	$20,899
3,000		* Sunrise			$2,207,744	$0
131		* Short Term Industrial			$9,744	$0
27,431				6,920		$6,103,777

* Have their own water and may not be reduced until their water is depleted

2007 Industrial Demands	**AF**	23,202	81% (includes La Paloma)
2007 Domestic Demands	**AF**	4,464	19%
	AF Total	**27,666**	

Impacts To Overcome Water Supply Shortage Stages & Conditions

STAGE I **District Can Meet Current Demands**

STAGE II	**3,458 AF Reduction**	**$3,335,918**		
	Miscellaneous expenditure reduction			$650,000
	Capital and Equipment reduction			$800,000
	Power costs will reduce			$1,200,000
	SWP costs/miscellaneous water purchases will reduce			$650,000
			Total	$3,300,000
STAGE III	**4,841 AF Reduction**	**$4,705,610**		
District will require monetary adjustments				
	Miscellaneous expenditure reduction			$800,000
	Capital and Equipment reduction			$1,200,000
	Power costs will reduce			$1,800,000
	SWP costs/miscellaneous water purchases will reduce			$900,000
			Total	$4,700,000
STAGE IV	**6,916 AF Reduction**	**$6,103,777**		
District will require monetary adjustments				
	Miscellaneous expenditure reduction			$1,275,000
	Capital and Equipment reduction			$1,575,000
	Power costs will reduce			$2,075,000
	SWP costs/miscellaneous water purchases will reduce			$1,275,000
			Total	$6,200,000

APPENDIX B

West Kern Water District
Water Appeal Form

Under the current Response Level 2 Water Alert, West Kern Water customers may appeal the issuance of a violation. The customer must fill out the attached Appeal Form.

Each appeal will be considered on a case-by-case basis. Please fill out the form completely and clearly state your case.

The completed form shall be returned to the Administration Department in any of the following manners:

Email: westkernwater@wkwd.org

Fax: 661-765-4271

Mail: West Kern Water District
P.O. Box 1105
Taft, CA 93268

In Person: West Kern Water District
800 Kern Street
Taft, CA 93268

If you have any questions or need assistance filling out the form, please contact the Administration Department at 661-763-3151.

West Kern Water District
Appeal Form

Site Information

Name	Utility Account Number

Location

Person Making Appeal	Phone Number

Relationship to Site		
❒ Owner	❒ Tenant	❒ Other:

Ownership/Tenant Information

Company Name	Tenant Contact Name

Telephone Number	Address

Cellular Phone Number	City

Email Address	State	Zip Code

Reason for Appeal

For West Kern Water District Use Only

❒ Approved ❒ Denied ❒ Informed of Appeal Process

Reviewed By: _____ Phone: _____ Date: _____

DRAFT

RESOLUTION NO. -06

RESOLUTION OF THE BOARD OF DIRECTORS OF
WEST KERN WATER DISTRICT
TO DECLARE A WATER SHORTAGE EMERGENCY

The West Kern Water District does hereby resolve as follows:

PURSUANT to California Water Code Section 350 et seq., the District has conducted duly noticed public hearings to establish the criteria under which a water shortage emergency may be declared.

WHEREAS, The West Kern Water District, Board of Directors finds, determines and declares as follows:

(a) West Kern Water District is the water purveyor for the property owners and inhabitants within the District sphere of influence.
(b) The demand for water service is not expected to lessen.
(c) When the total water supply available to West Kern Water District, from all sources falls at or below the Stage II triggering levels described in the 2005 Urban Water Management Plan, the West Kern Water District will declare a water shortage emergency. The water supply would not be adequate to meet the ordinary demands and requirements of water customers without depleting the District's water supply to the extent that there may be insufficient water for human consumption, sanitation, fire protection, and environmental requirements. This condition is likely to exist until water is sufficiently replenished in the District's well field or until water system damage resulting from disaster are repaired and normal water service is restored.

NOW, THEREFORE, BE IT RESOLVED that the West Kern Water District , Board of Directors, hereby directs the Secretary of the District to find, determine, declare and conclude that a water shortage emergency condition exists that threatens the adequacy of water supply, until the District's water supply is deemed adequate.

BEFORE THE BOARD OF DIRECTORS
OF
WEST KERN WATER DISTRICT

In the Matter of:	)	
	)	
Rescinding Ordinance 00-1	)	ORDINANCE NO. 10-1
And Implementing a Water	)	
Shortage Response Plan	)	

THE WEST KERN WATER DISTRICT DOES ORDAIN as follows:

Pursuant to the authority granted to the District by Sections 31024 through 31027 of the Water Code, it is hereby ordained by the West Kern Water District Board of Directors as follows:

1. That Ordinance No. 00-1 Prohibiting the Waste of Water is rescinded.
2. That in order to conserve the District's water supply for the greatest public benefit, and to reduce the quantity of water used by the District's customers, it is necessary to implement water conservation/restriction measures as outlined in the Water Shortage Response Plan.

SECTION I. PURPOSE

The purpose of this Water Shortage Response Plan Ordinance is to inform West Kern Water District (WKWD) customers and interested parties of: (1) any local and regional water supply shortage situation, (2) the policies by which WKWD will implement and administer measures to address water shortages, (3) the conservation/restriction measures WKWD will undertake to ensure adequate water supplies to its customers; and (4) the process by which penalties will be imposed for violations and process by which customers may appeal.

SECTION II. WATER SHORTAGE RESPONSE PLAN

In response to a state, county or District water supply shortage, WKWD will implement conservation measures as outlined in the attached West Kern Water District Water Shortage Response Plan (WSRP), together with any future amendments thereto. The WSRP is designed to ensure adequate supplies for customers without depleting the District's water supply to the extent that there may be insufficient water for human consumption, sanitation, and fire protection.

In addition to voluntary conservation measures, it may become necessary to implement mandatory compliance measures to ensure conservation. If this occurs, WKWD may implement measures as outlined in one or more of the WSRP's Response Levels, which are commensurate with the severity of the

water supply situation and in accordance with this ordinance and resolutions, which may be adopted.

The following principles will guide WKWD's implementation of these measures:

a) Communication and Outreach - WKWD staff will ensure timely and appropriate communication with the WKWD Board of Directors, customers, including residential, commercial and industrial customers, businesses, governmental bodies and schools.

b) Appropriate water use practices/conservation measures shall be utilized as needed to accomplish goals, limiting financial impacts and/or shut-offs to those customers who fail to meet conservation measures including fines up to $600.00, criminal penalties, and discontinuance of water service.

c) An appeal process shall be available to all customers.

SECTION III. SEVERABILITY

If any section or portion of this Ordinance including the Water Shortage Response Plan attachment is found to be invalid, the District hereby declares such decision shall not affect the validity of the remaining portions of this Ordinance or any part thereof.

SECTION IV. EFFECTIVE DATE

Before the expiration of fifteen (15) days after its passage, this Ordinance shall be published in a newspaper of general circulation, printed and published in the City of Taft. This Ordinance shall take effect immediately after publication.

The foregoing Ordinance was introduced at a meeting of the Board of Directors of the West Kern Water District on January 26, 2010, and adopted at said meeting by the following vote:

AYES: President Stephen J. Steinhoffer
Vice President David A. Wells
Director Charles H. Comfort
Director Gary J. Morris

NOES:

ABSTAIN:

ABSENT: Director Thomas M. LecLair

STEPHEN J. STEINHOFFER,
President of the Board of Directors
of the West Kern Water District

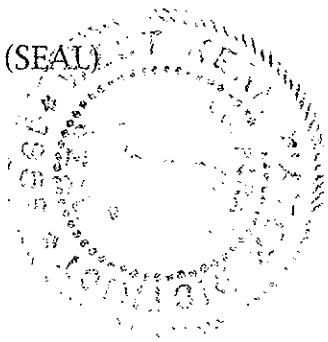
SECRETARY'S CERTIFICATE

I, **JERRY W. PEARSON,** being the appointed Secretary of the **WEST KERN WATER DISTRICT,** do hereby certify that the above and foregoing **ORDINANCE 10-1** was duly adopted by the Board of Directors of said District at a legally convened meeting of said Board held on the **26th day of January, 2010,** that the above and foregoing is a full, true, and correct copy of **ORDINANCE 10-1,** and that the same has not been amended or repealed.

ATTEST:

JERRY W. PEARSON, Secretary of the Board of Directors of the West Kern Water District

(SEAL)



RESOLUTION NO. 06-09

RESOLUTION OF THE BOARD OF DIRECTORS OF
WEST KERN WATER DISTRICT
WATER MANAGEMENT PLAN 2005
ADOPTING, DIRECT FILING, AND IMPLEMENTING THE 2005 REVISION OF
THE WEST KERN WATER DISTRICT WATER MANAGEMENT PLAN
Rescinds Resolution No. 00-05

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.), known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, AB-797 requires that said Plan be periodically reviewed at least once every five years, and that the urban water supplier shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS, the West Kern Water District is an urban supplier of water providing water to over 7,000 customers, and has therefore, prepared and circulated for public review a Draft Urban Water Management Plan, in compliance with the requirements for AB-797, and properly noticed public hearing regarding said Draft Plan was held by the Board of Directors of November 28, 2006, and Final Plan prepared;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of West Kern Water District as follows:

1. The Urban Water Management Plan is hereby adopted;

2. The General Manager is hereby authorized and directed to file the Plan with the California Department of Water Resources within 30 days after this date.

All the foregoing being upon the motion of Director Kauhn, seconded by Director LeClair, carried by the following vote:

AYES: President Stephen J. Steinhoffer
Vice-President David A. Wells
Director Richelle A. Kauhn
Director Thomas M. LeClair
Director Charles H. Comfort

NOES: None

ABSENT: None

ABSTAIN: None

ADOPTED, SIGNED, AND APPROVED this 28th day of November, 2006.

Stephen J. Steinhoffer,
President of the
Board of Directors of
WEST KERN WATER DISTRICT

SECRETARY'S CERTIFICATE

I, Jerry W. Pearson, being appointed Secretary of the Board of Directors of the **West Kern Water District**, do hereby certify that the above and foregoing **RESOLUTION NO. 06-09** was duly adopted by the Board of Directors of said District at a legally convened meeting of said Board held on the **28th day of November, 2006**, that the above and foregoing is a full, true, and correct copy of **RESOLUTION NO. 06-09.**

ATTEST:

(SEAL)

Jerry W. Pearson, Secretary of the
Board of Directors of
West Kern Water District